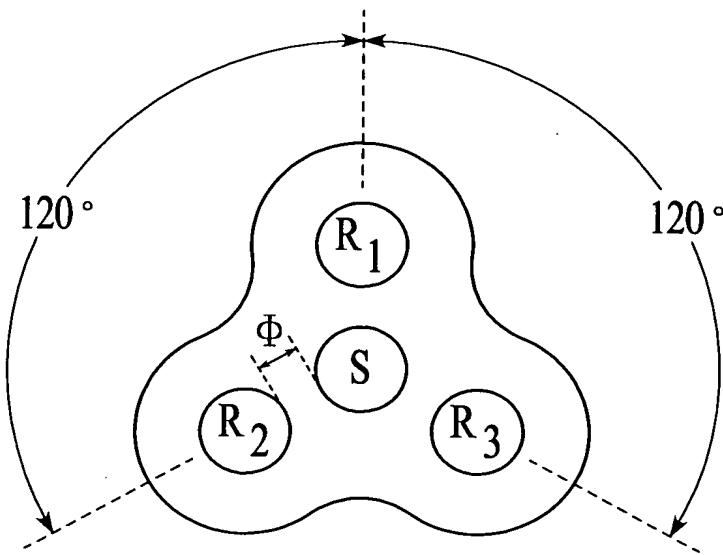


FIG. 1



R - LIGHT RECEIVER FIBER OPTICS
S - LIGHT SOURCE FIBER OPTIC

FIG. 2

2010 RELEASE UNDER E.O. 14176

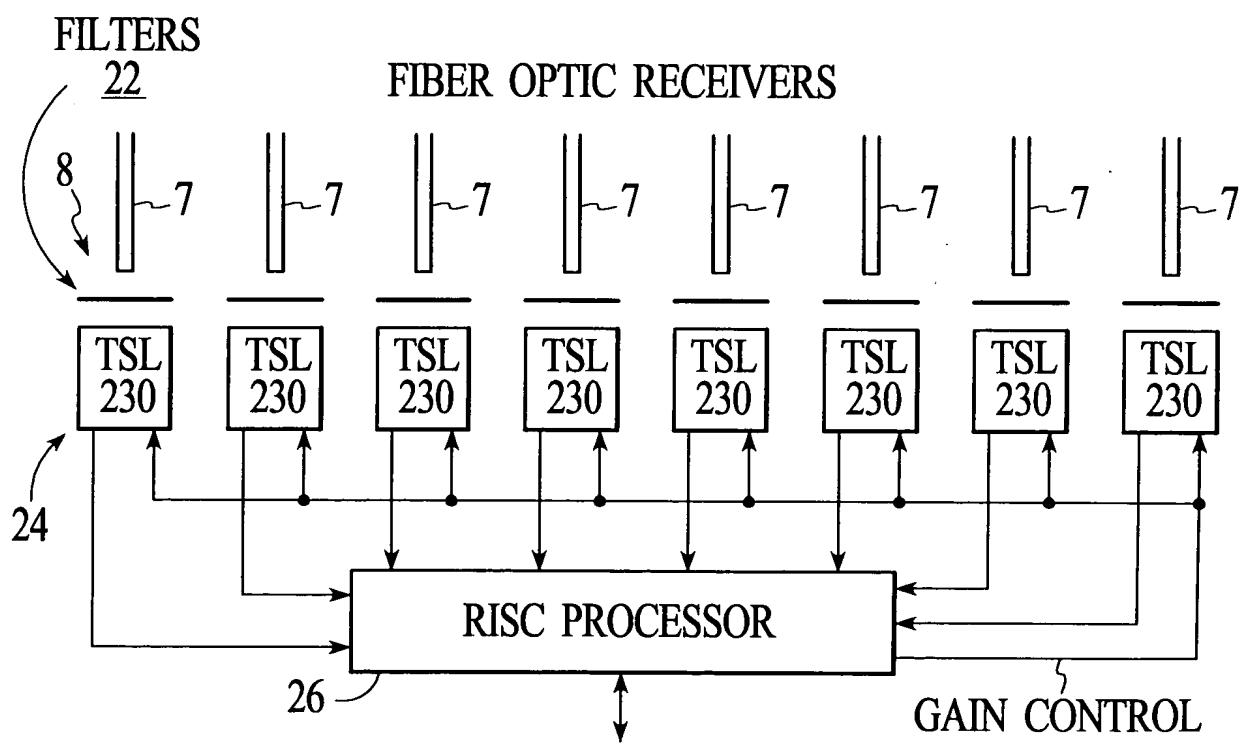


FIG. 3

204070 "5026001"

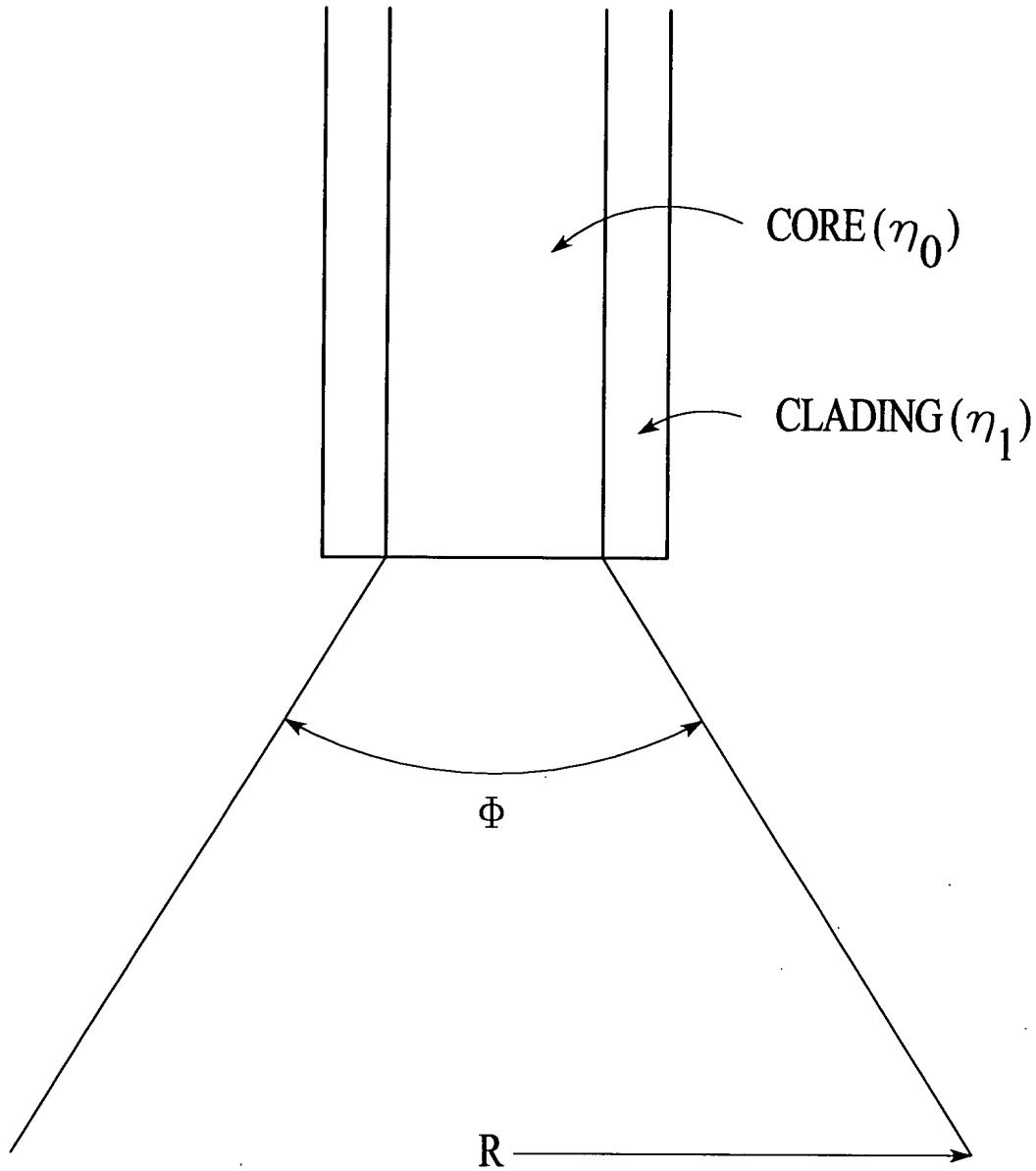


FIG. 4A

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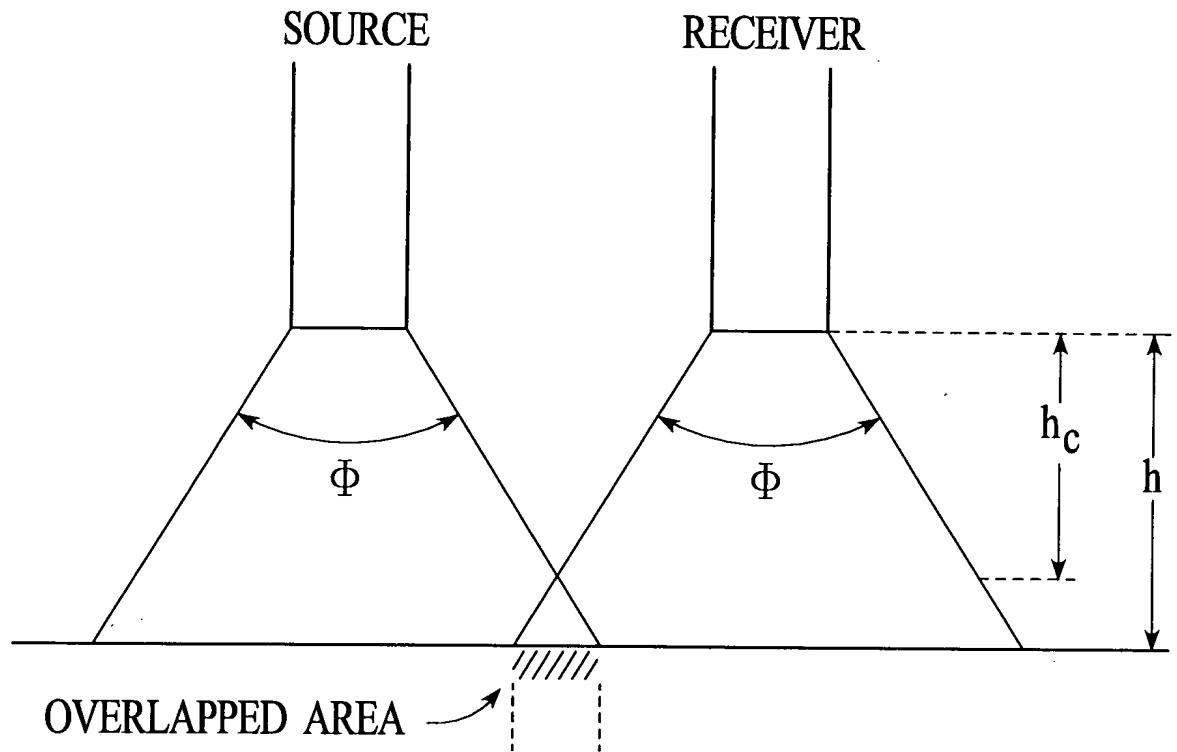


FIG. 4B

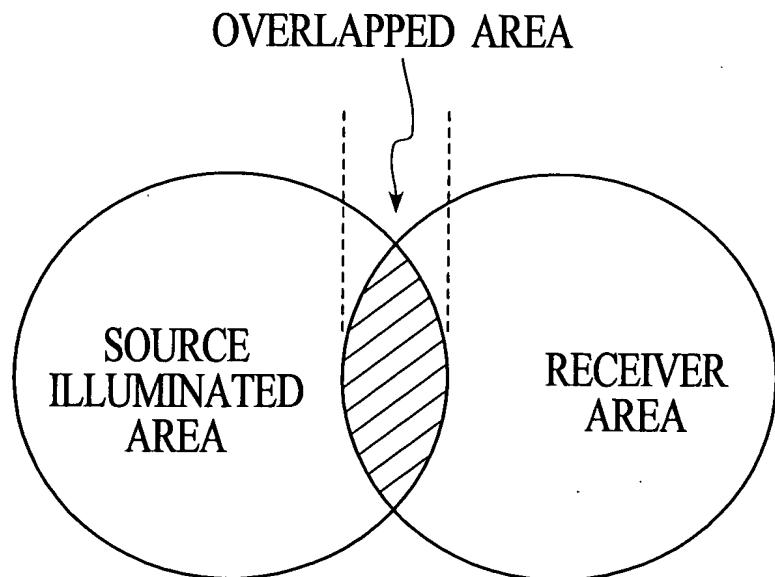


FIG. 4C

40039205 - 000400

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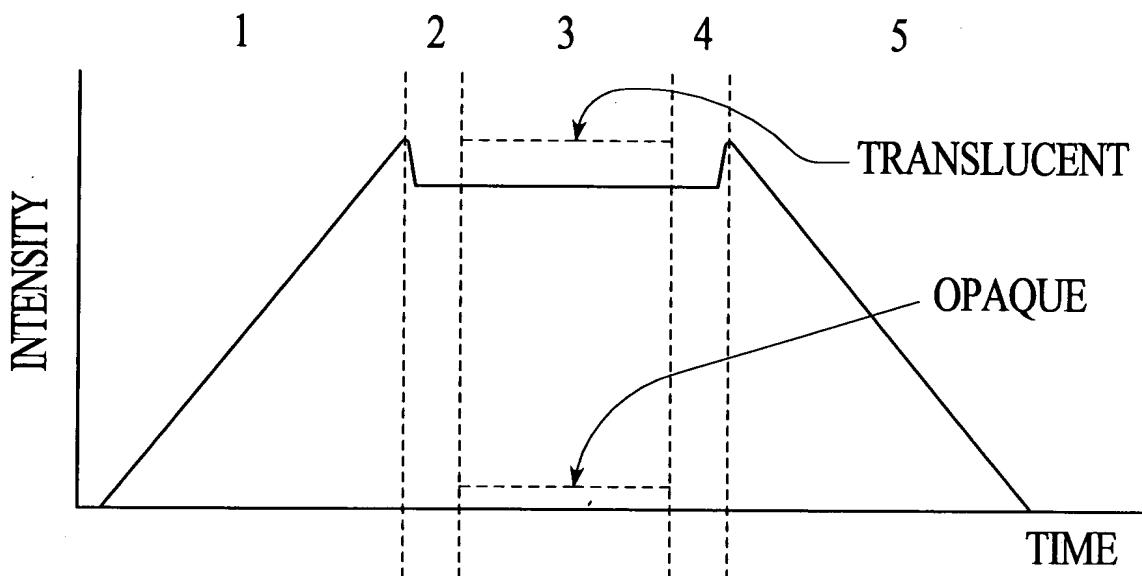


FIG. 5A

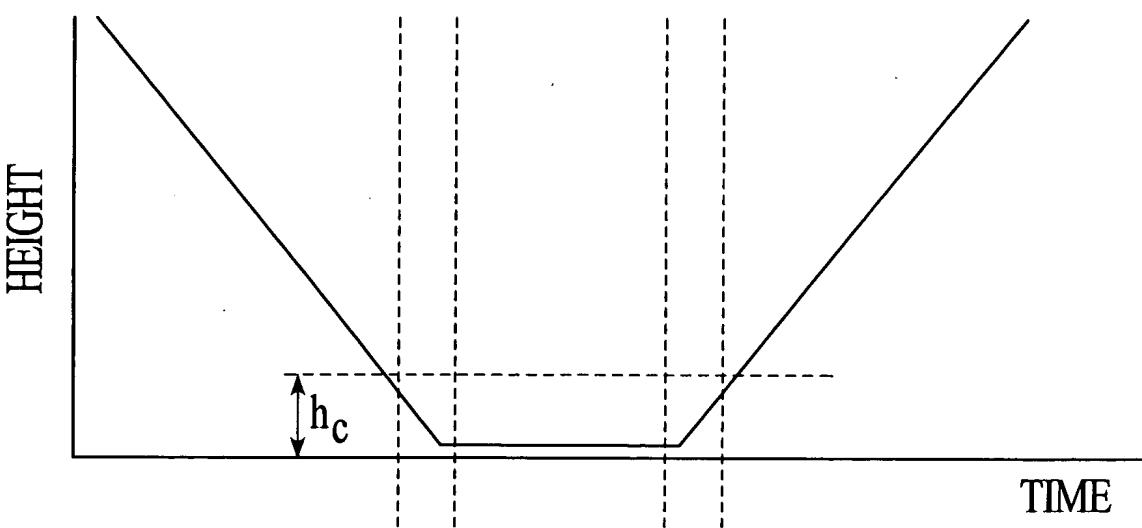
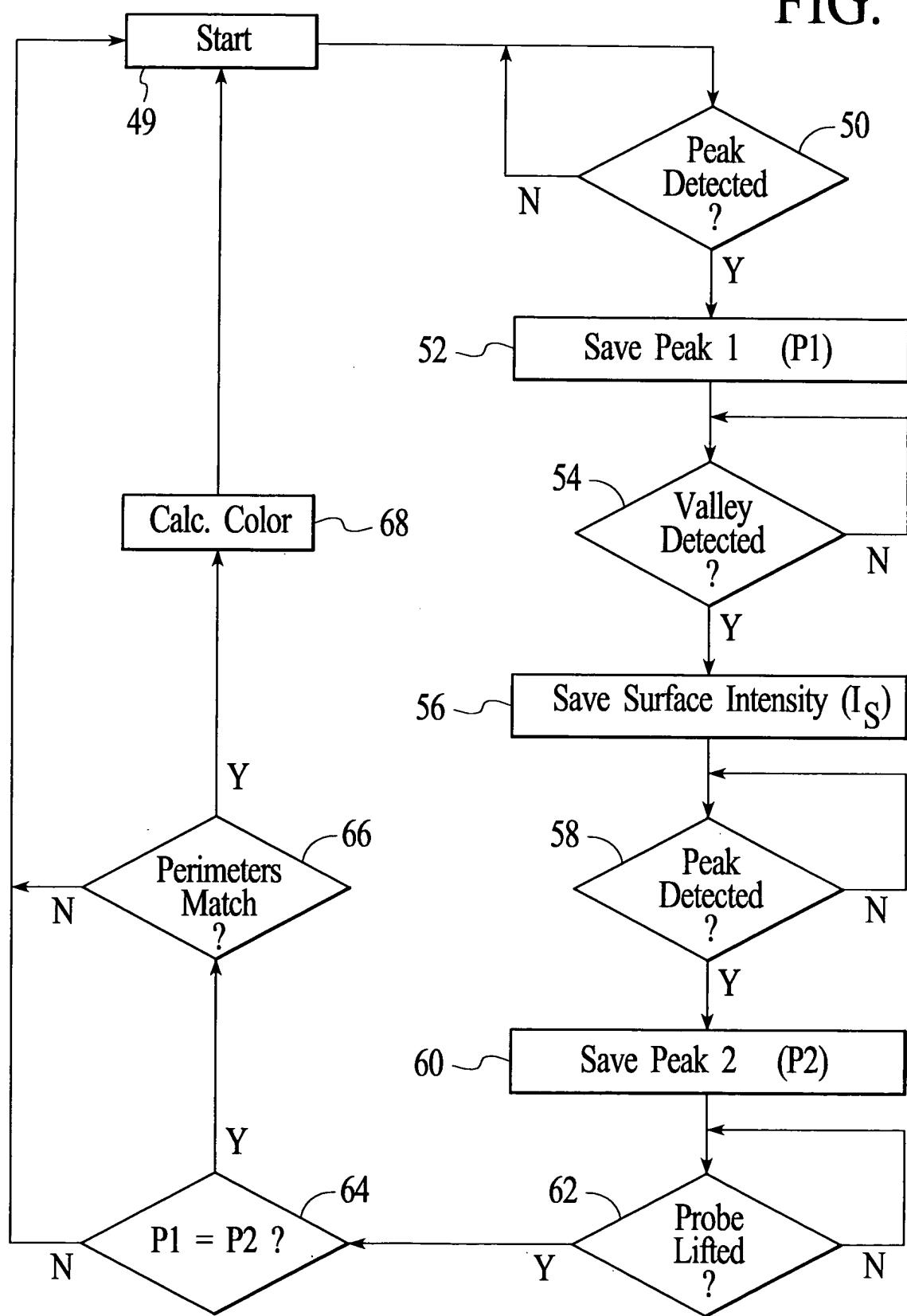


FIG. 5B

40039205 - 010326

FIG. 6



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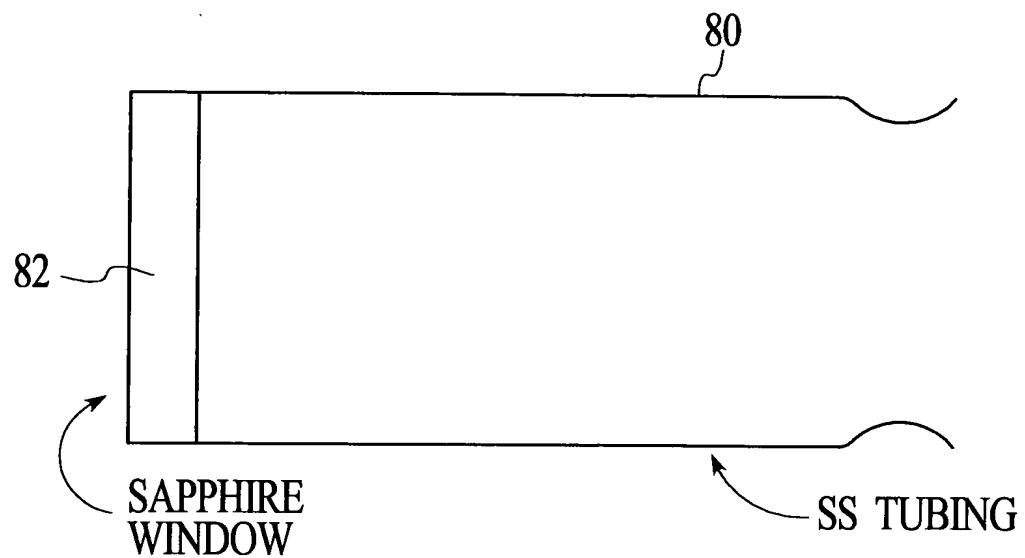


FIG. 7A

20090620050040

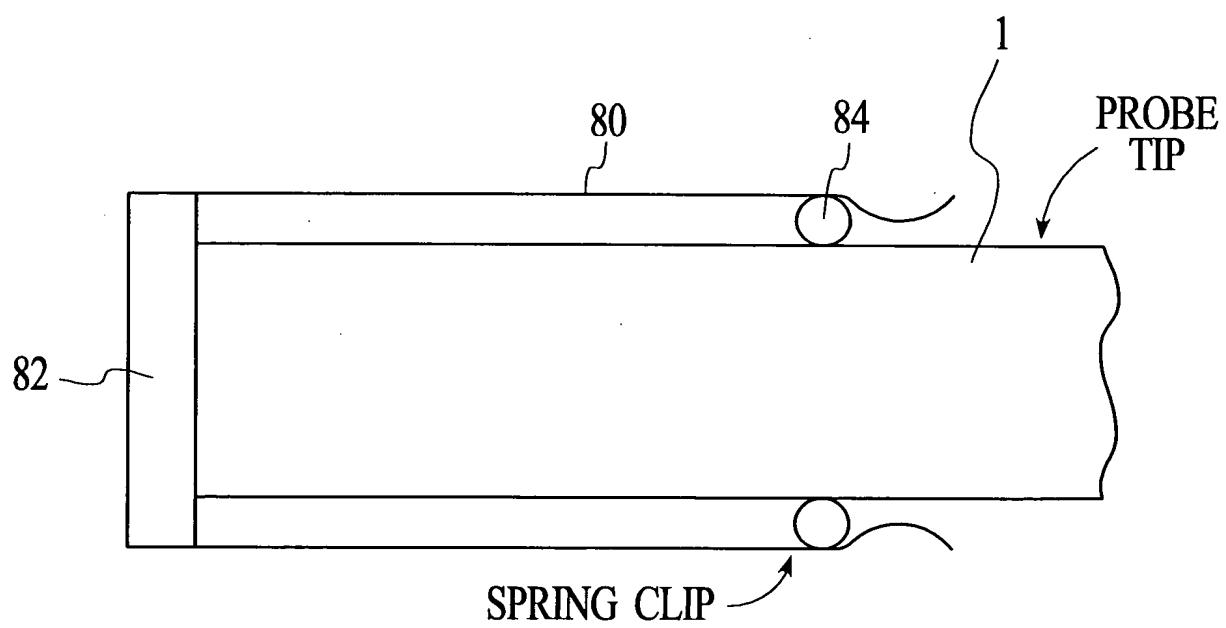


FIG. 7B

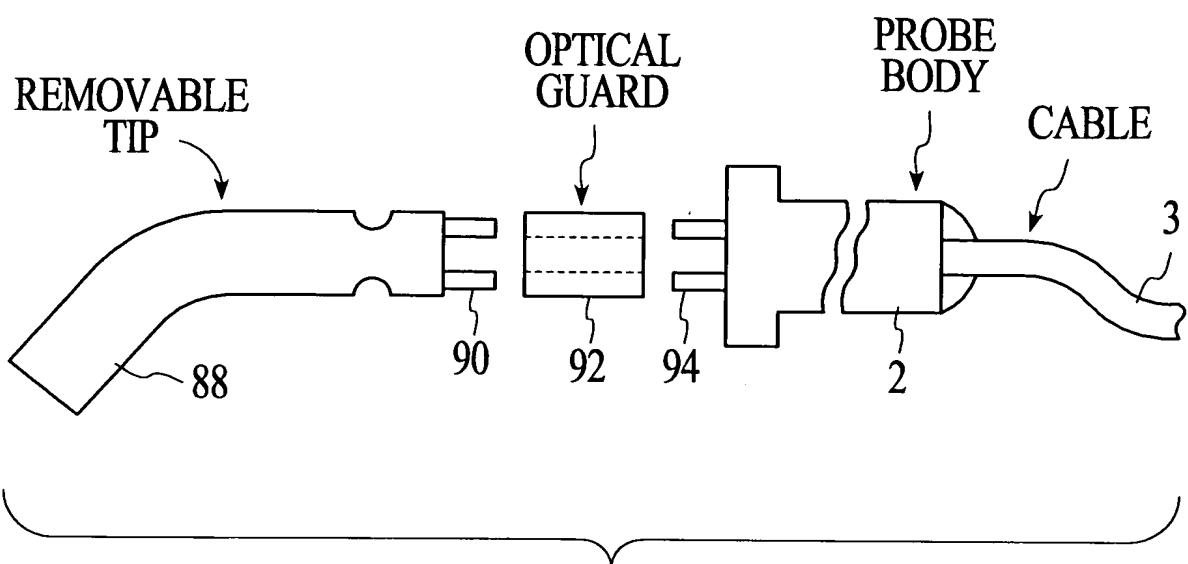


FIG. 8A

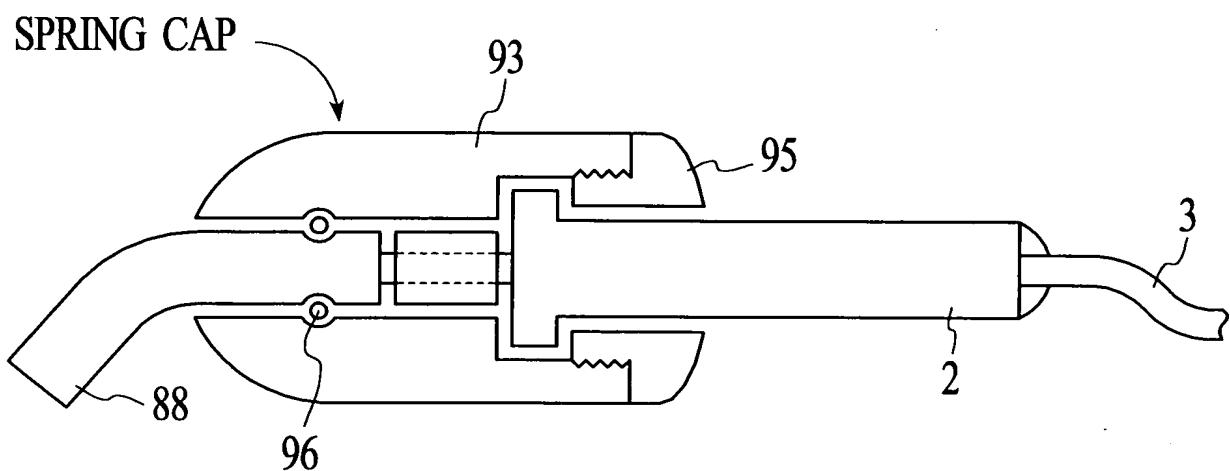
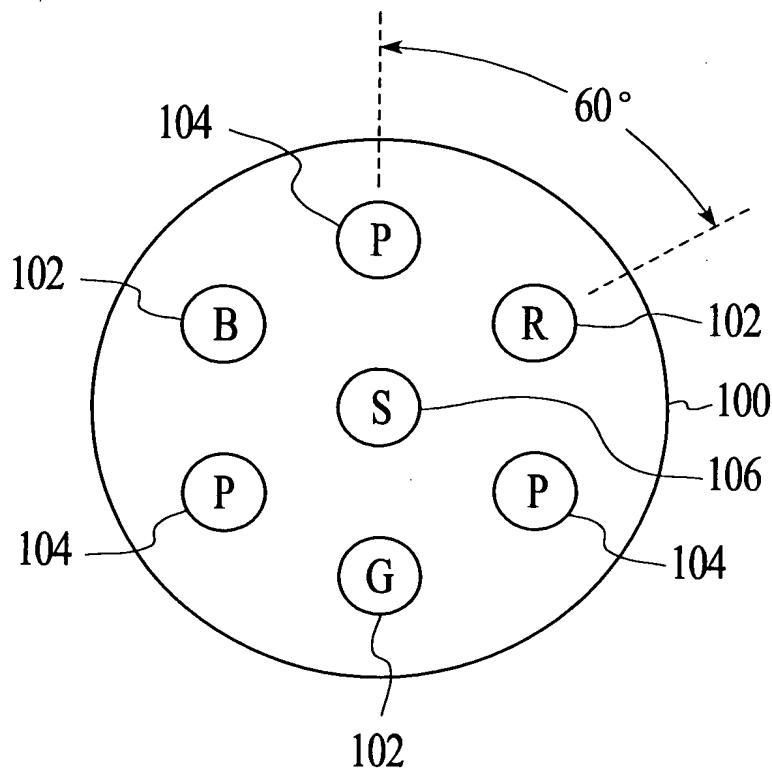


FIG. 8B



S - LIGHT SOURCE FIBER
R - RED RECEIVER
G - GREEN RECEIVER
B - BLUE RECEIVER
P - NEUTRAL (FULL BAND) RECEIVERS

FIG. 9

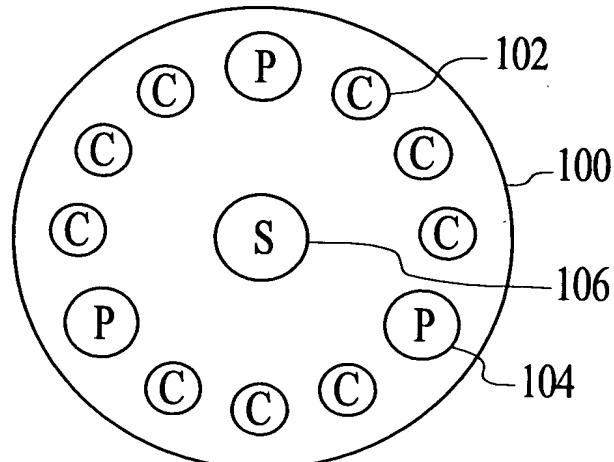


FIG. 10A

20039205.5040402

S - LIGHT SOURCE FIBER
 P - NEUTRAL (FULL BAND) RECEIVER
 C - COLOR RECEIVER

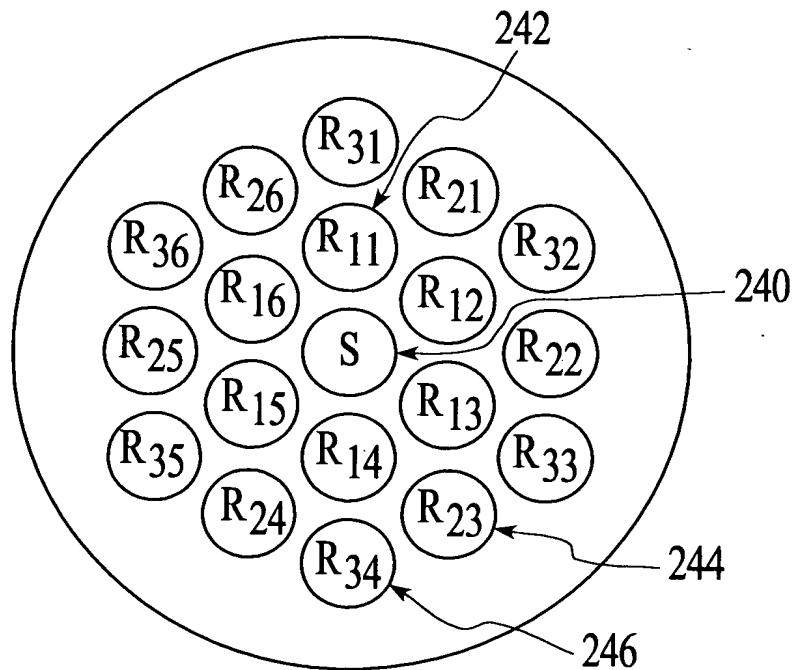
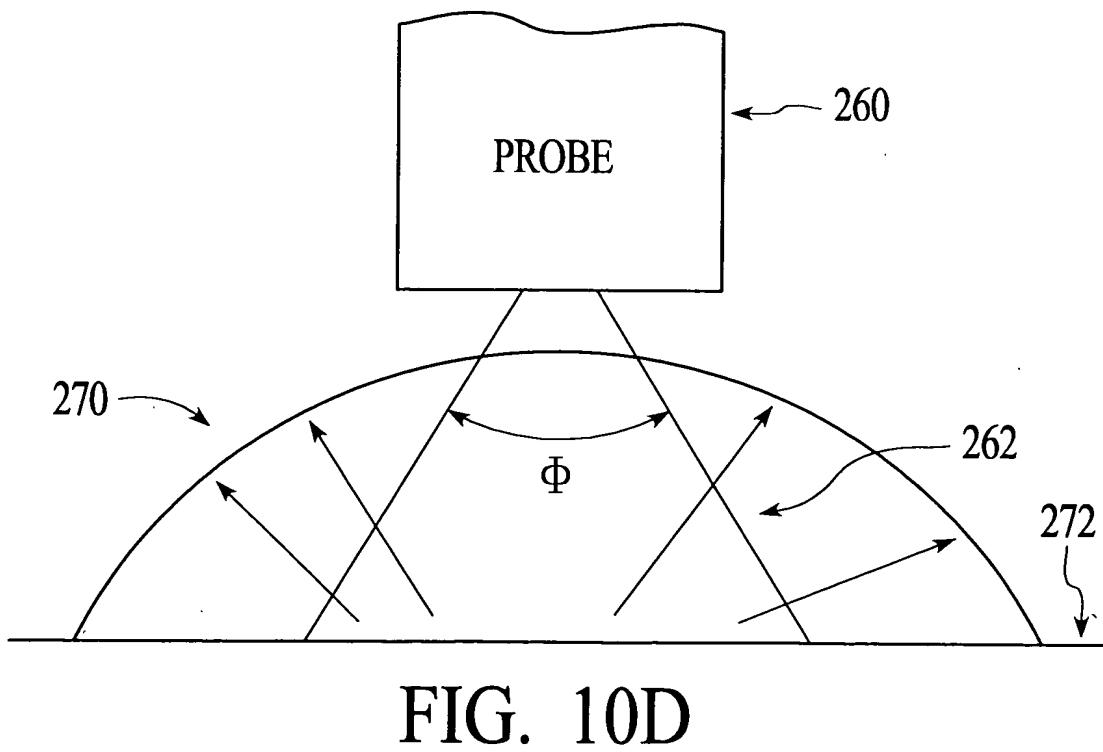
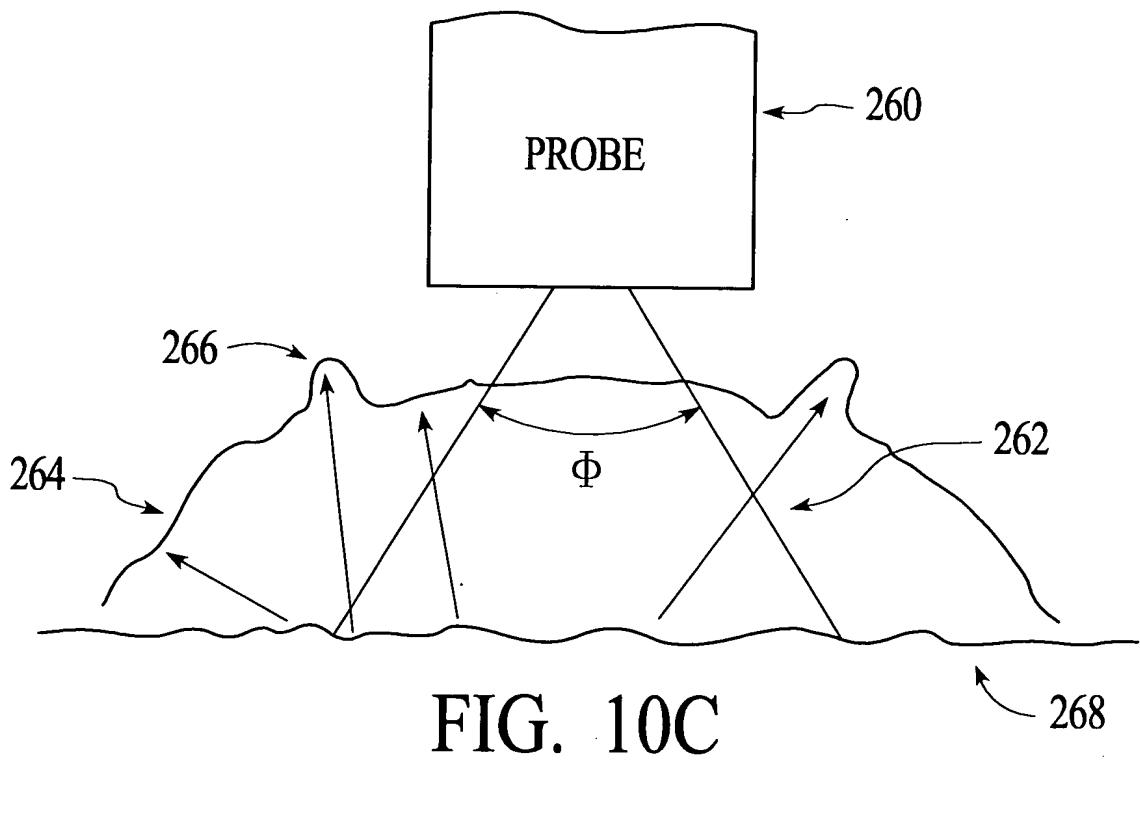


FIG. 10B

S - LIGHT SOURCE FIBER
 R_{1X} - INNER RING RECEIVER FIBER
 R_{2X} - 2nd RING RECEIVER FIBER
 R_{3X} - 3rd RING RECEIVER FIBER

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1000362602001000

4,089,205 - 02/10/82

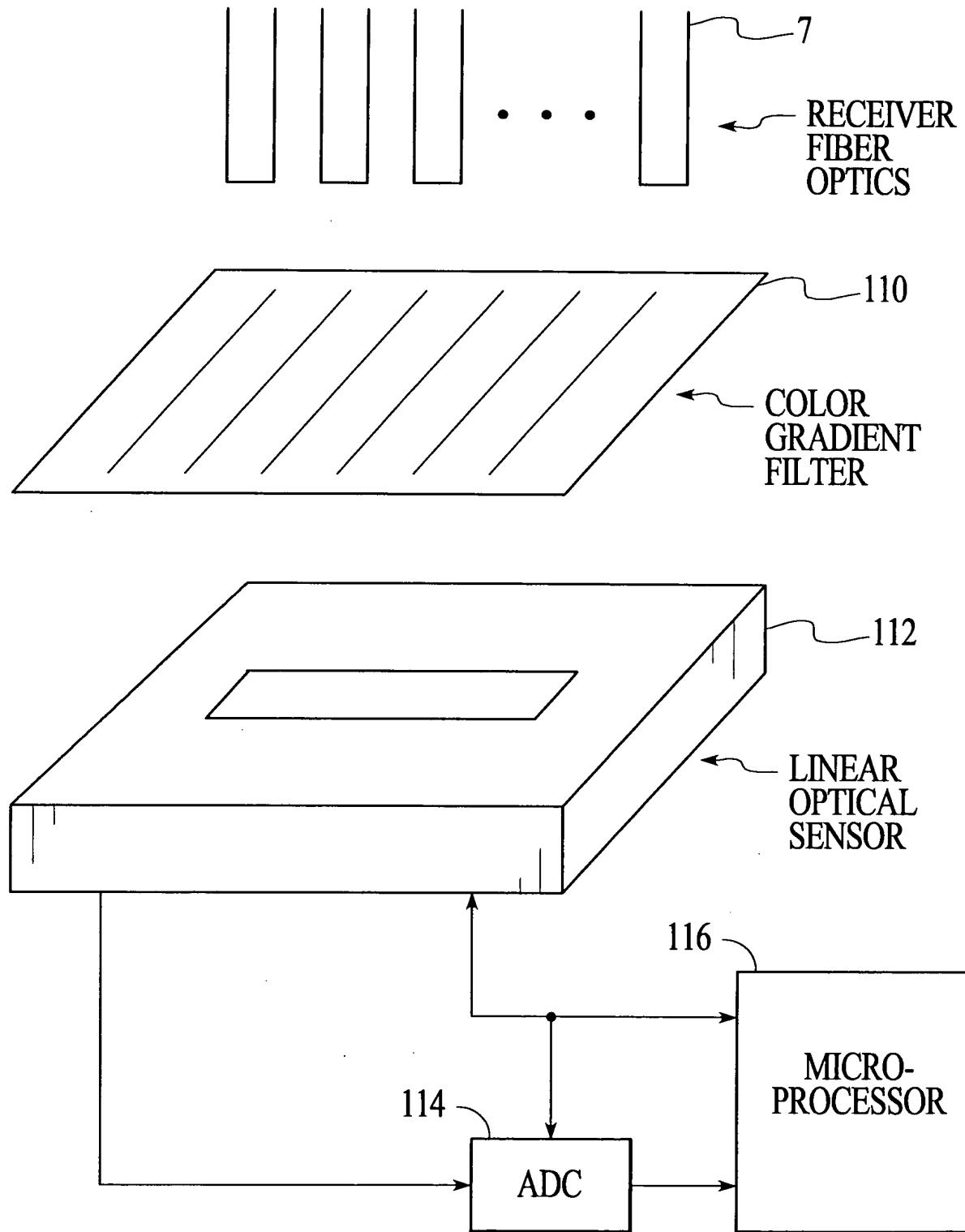


FIG. 11

10039205 - DT-02

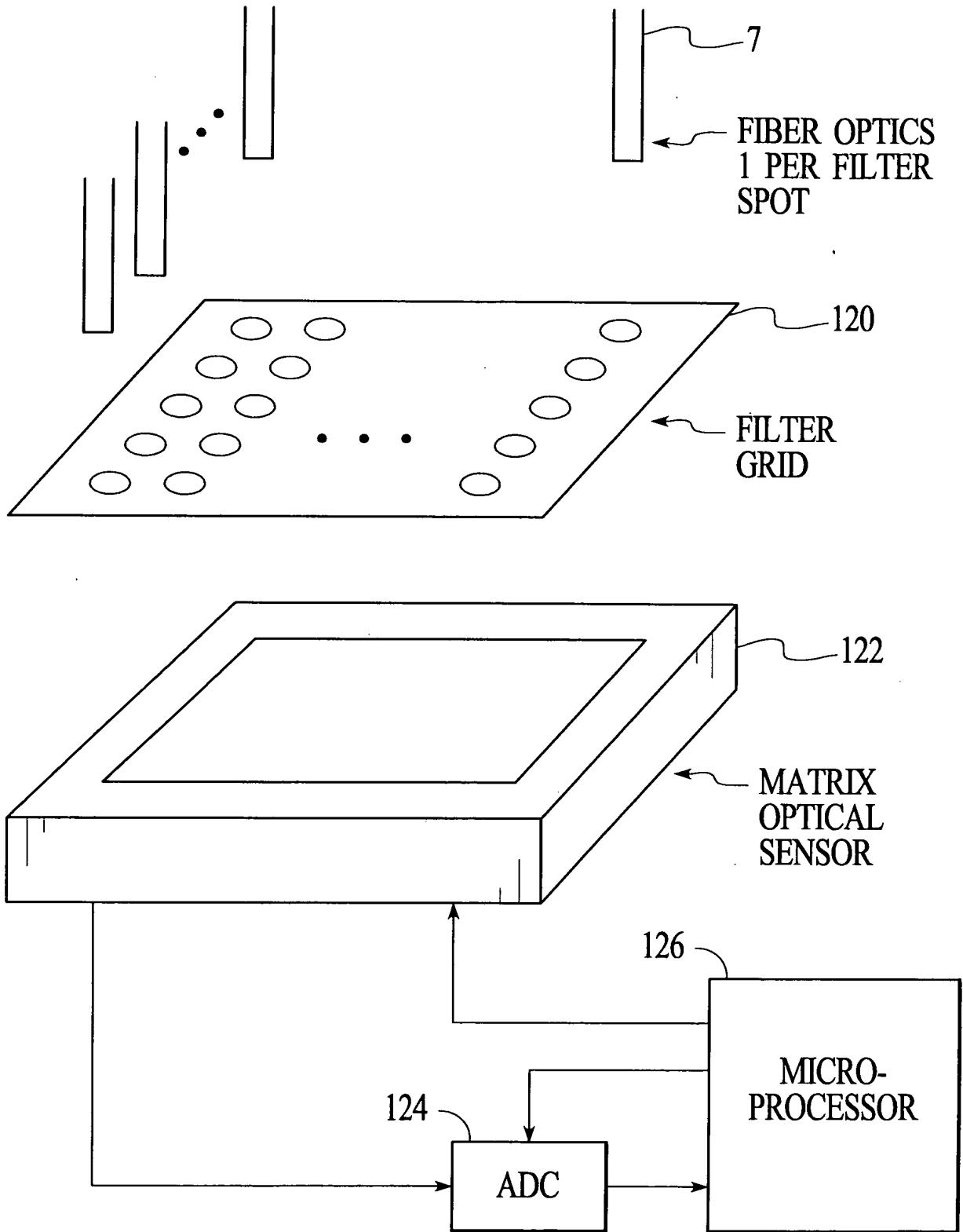


FIG. 12

SINGLE FILTER PROPERTIES (SPECTRUM)

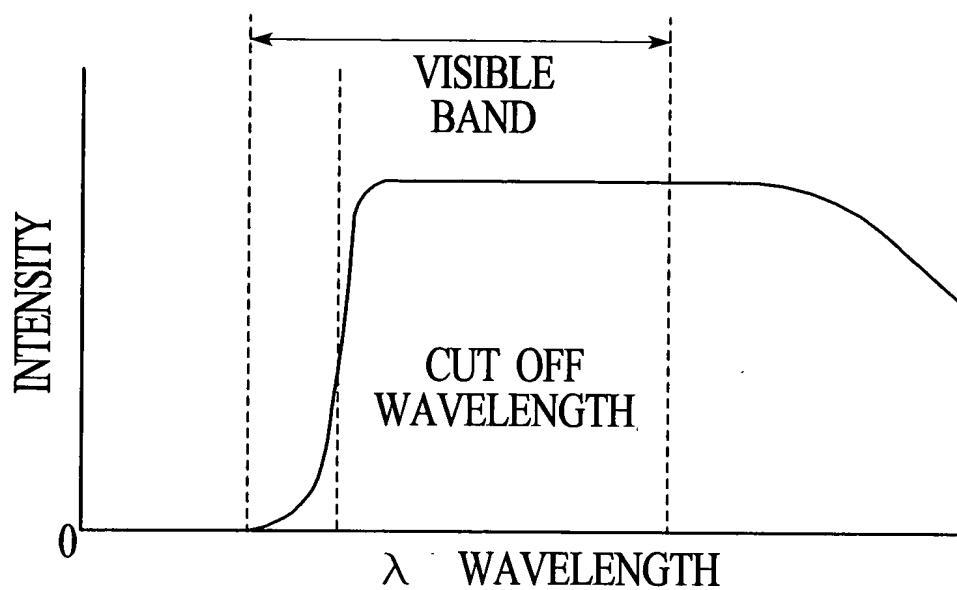


FIG. 13A

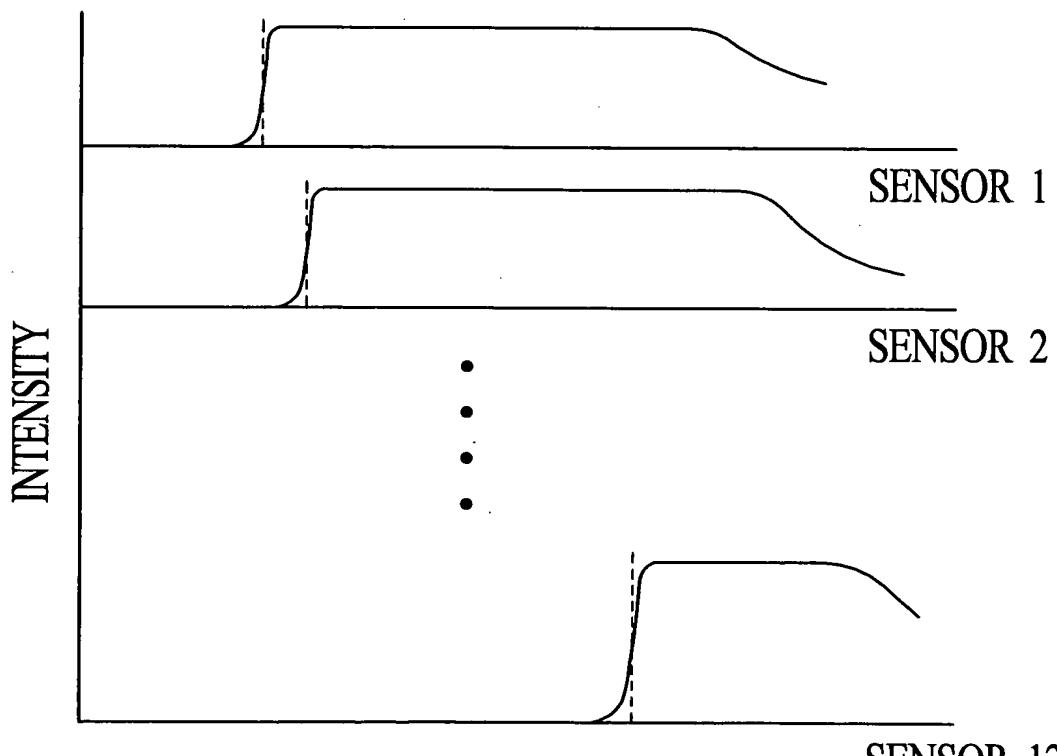


FIG. 13B

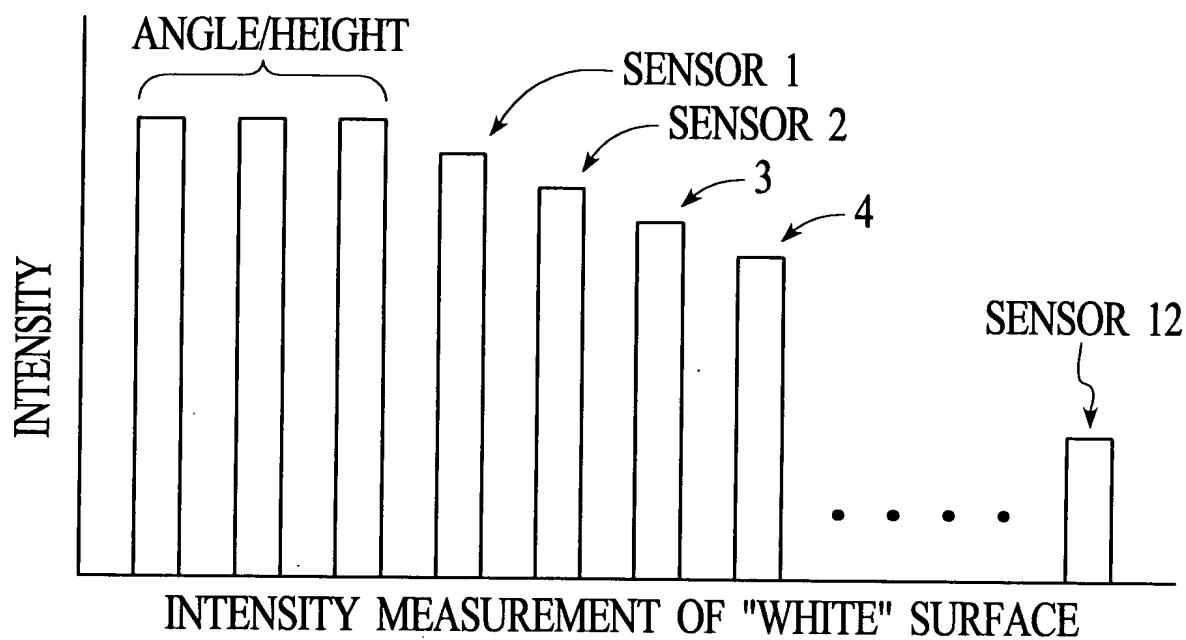


FIG. 14A

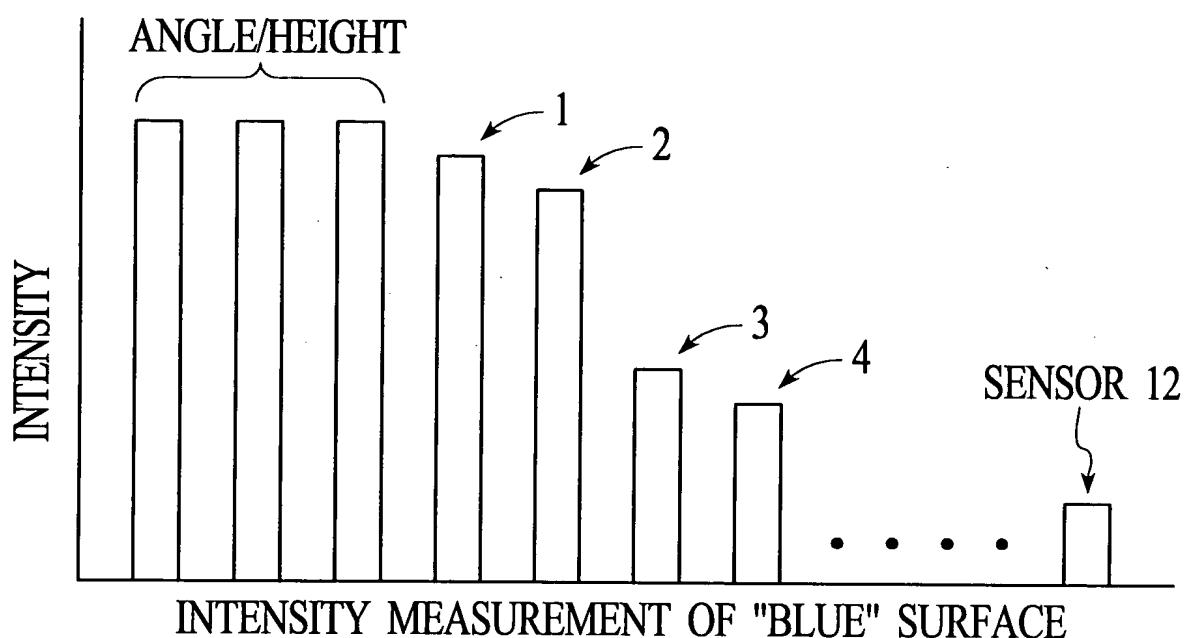


FIG. 14B

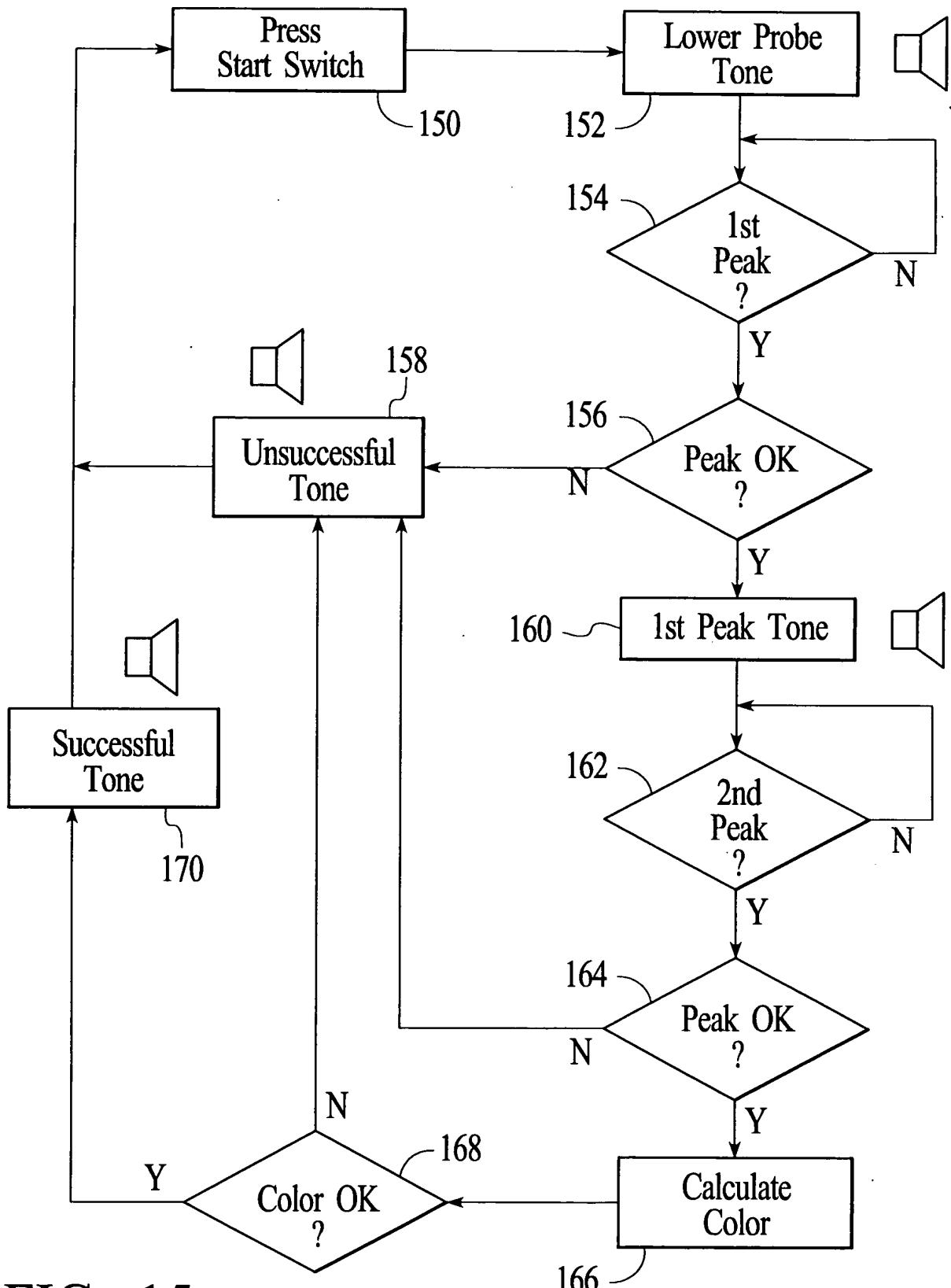


FIG. 15

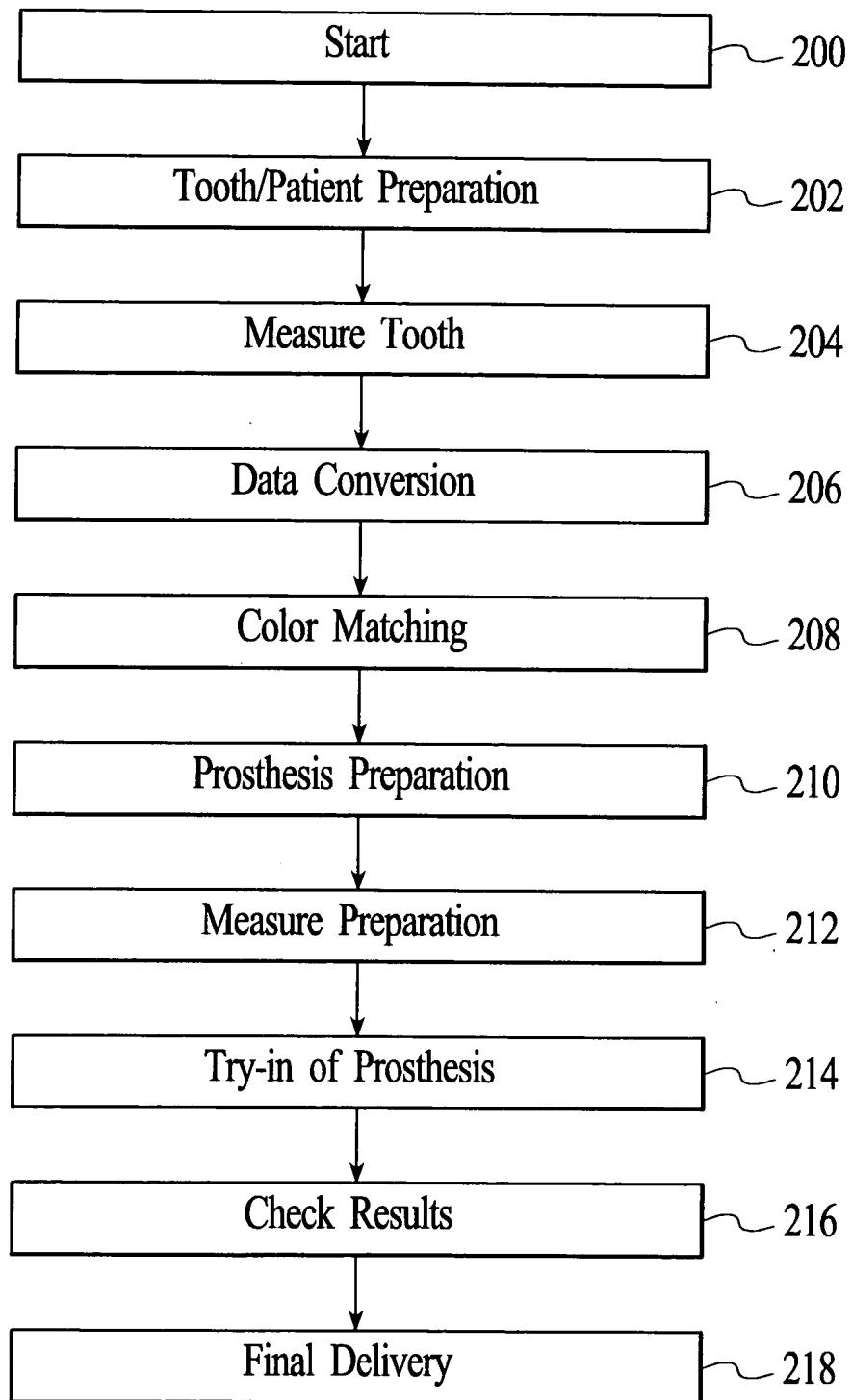


FIG. 16A

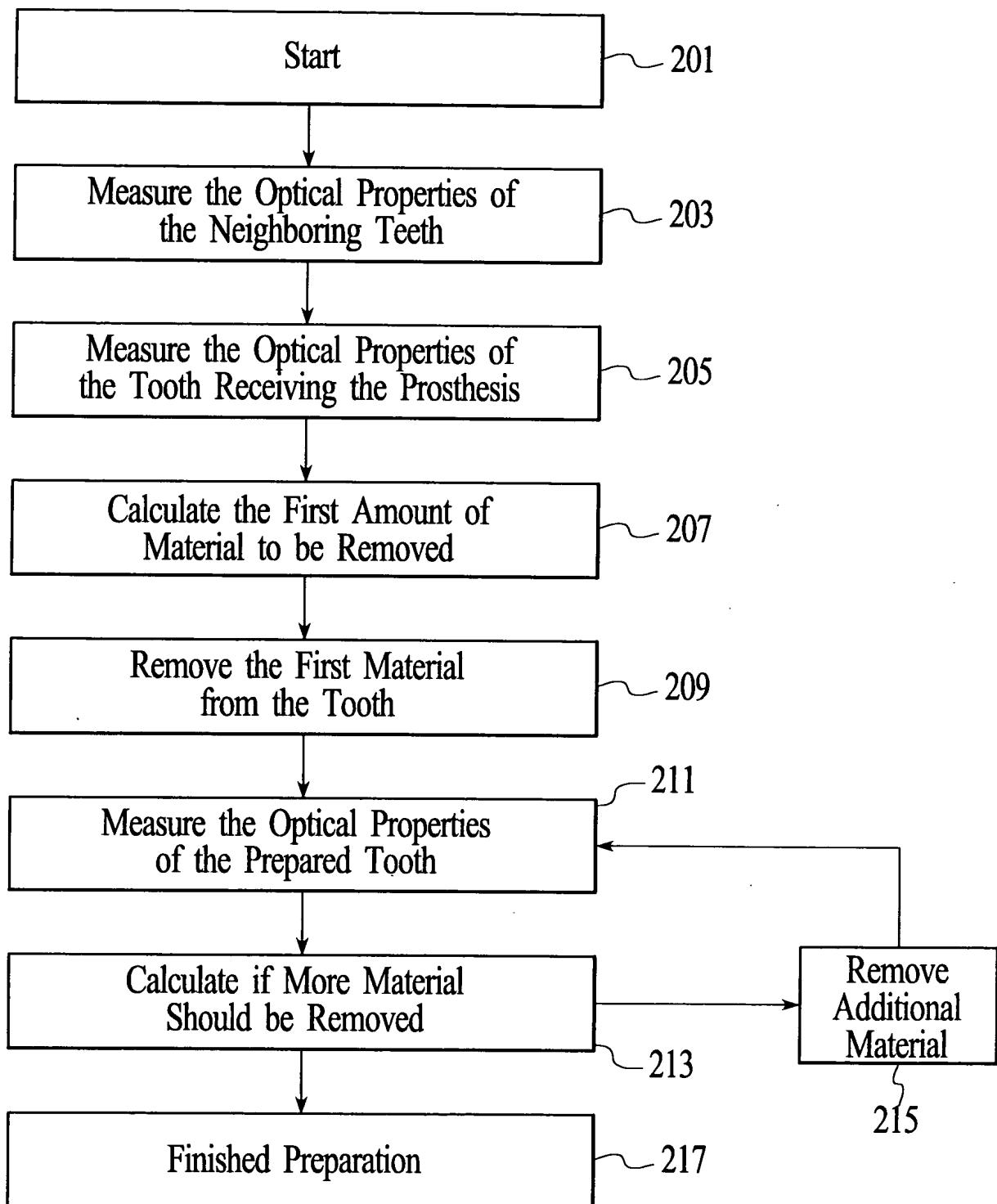


FIG. 16B

INTRAORAL POSITIONING DEVICE

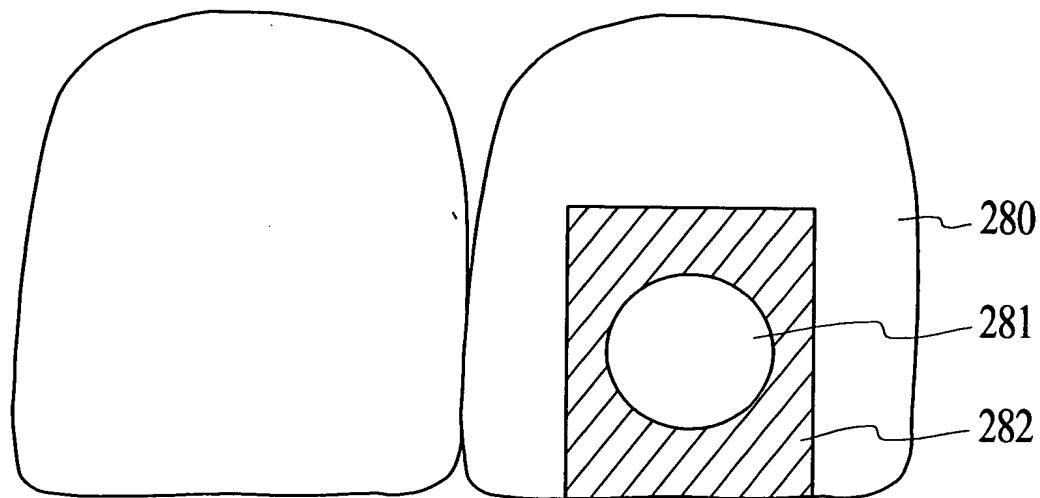


FIG. 17A

20140720 - 00000000000000000000000000000000

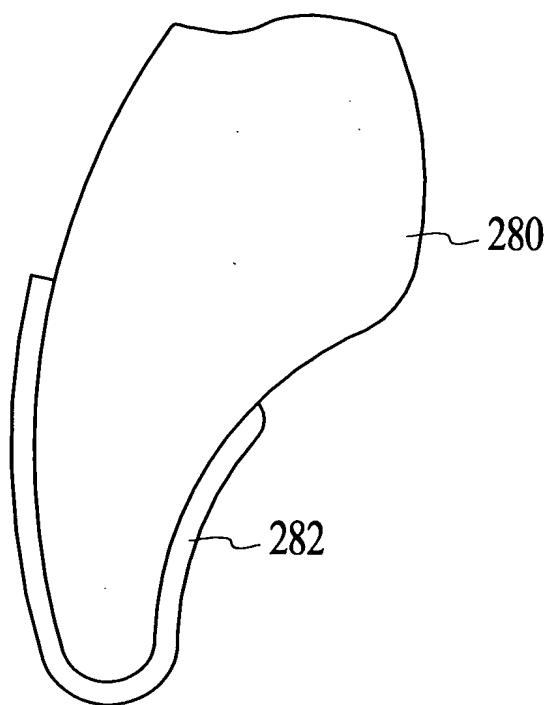


FIG. 17B

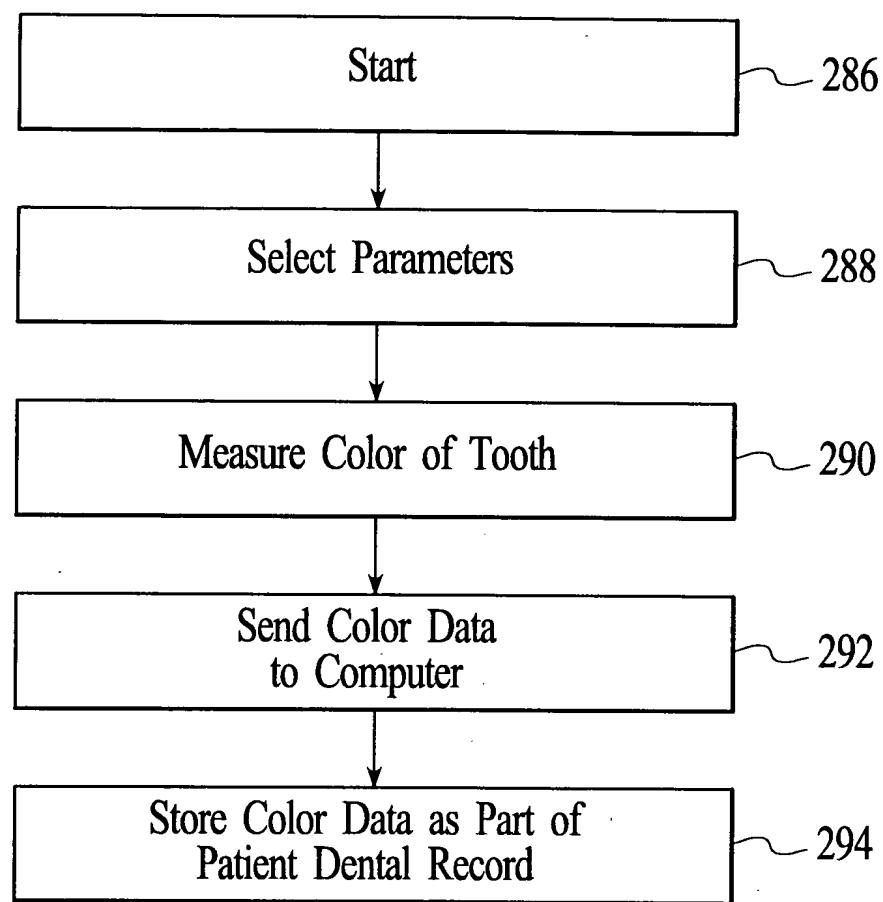
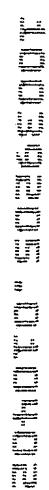


FIG. 18

100039205 - 5040122

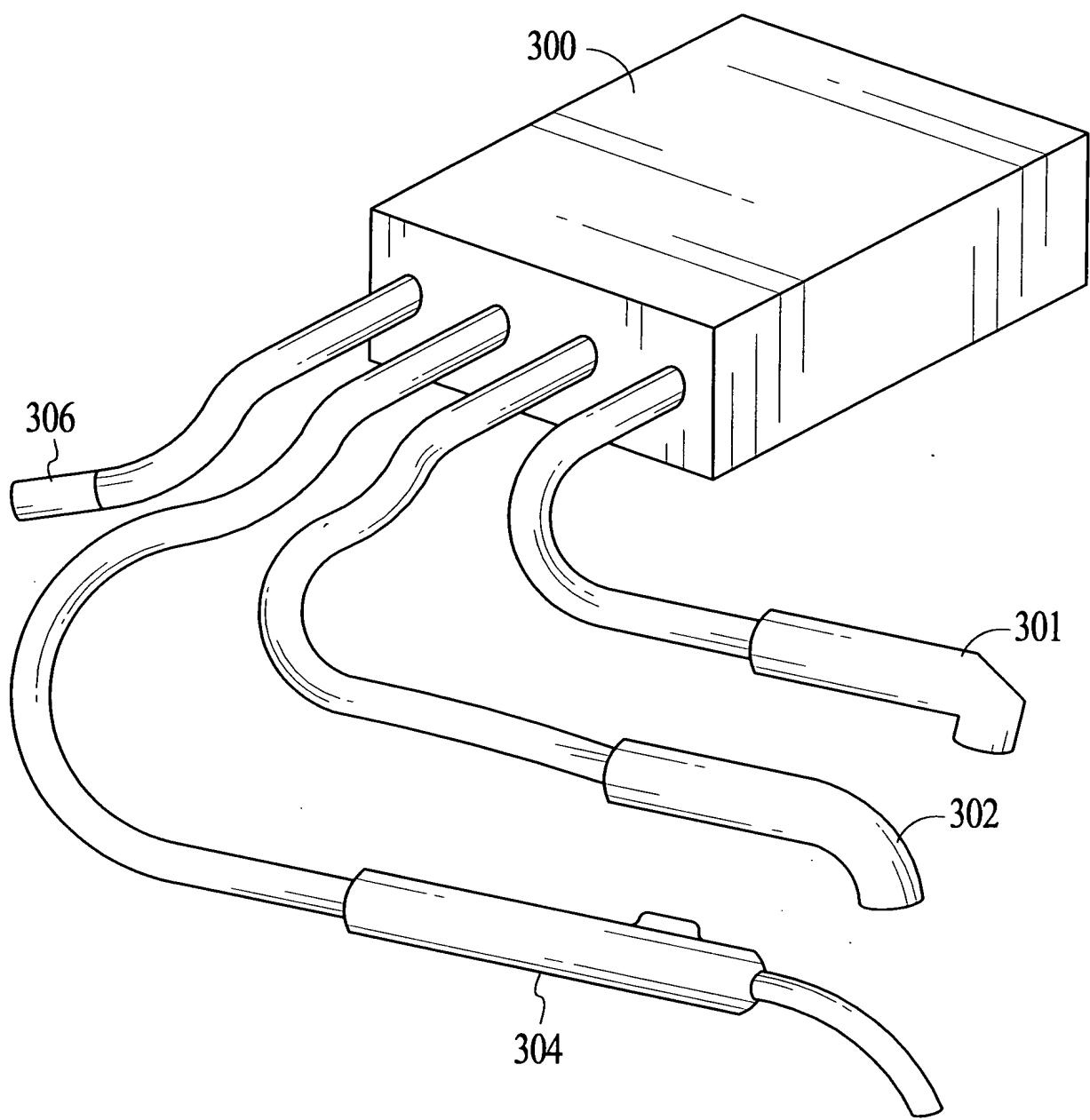


FIG. 19

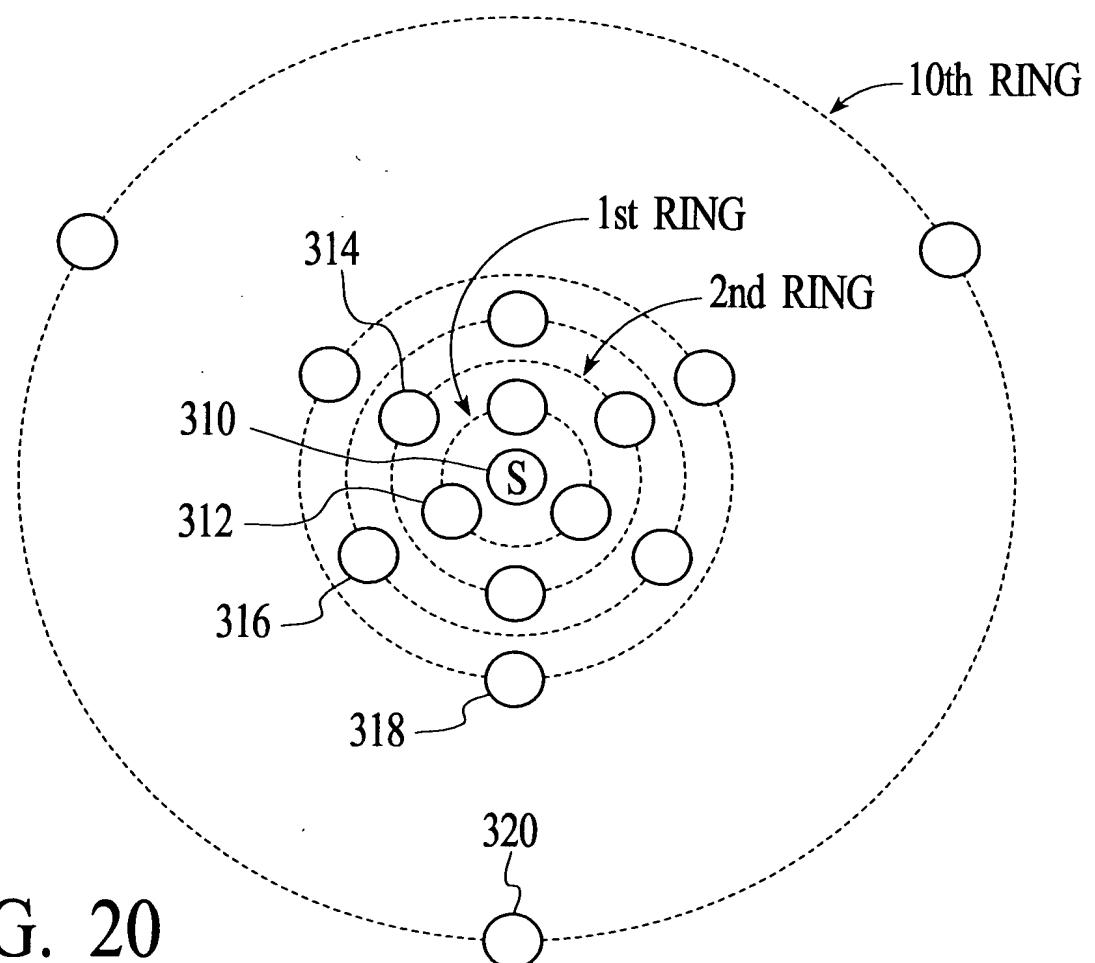


FIG. 20

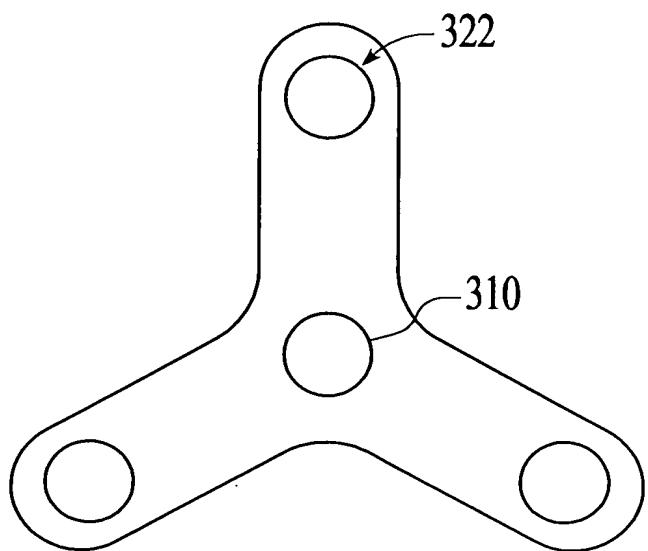


FIG. 21

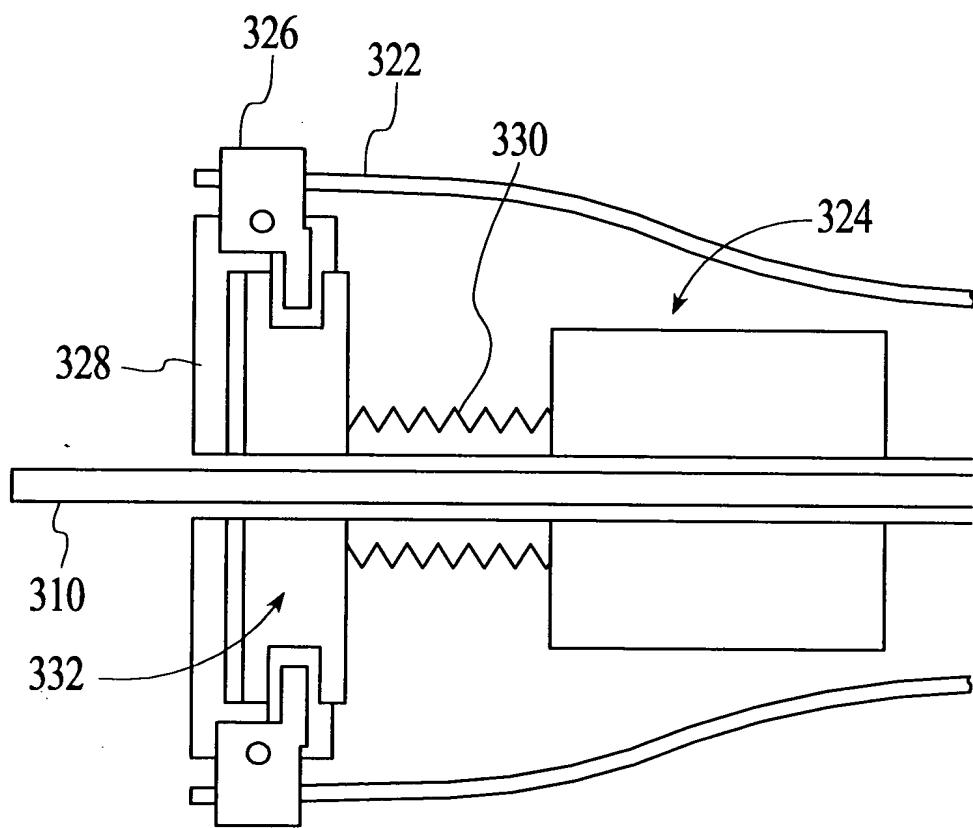


FIG. 22

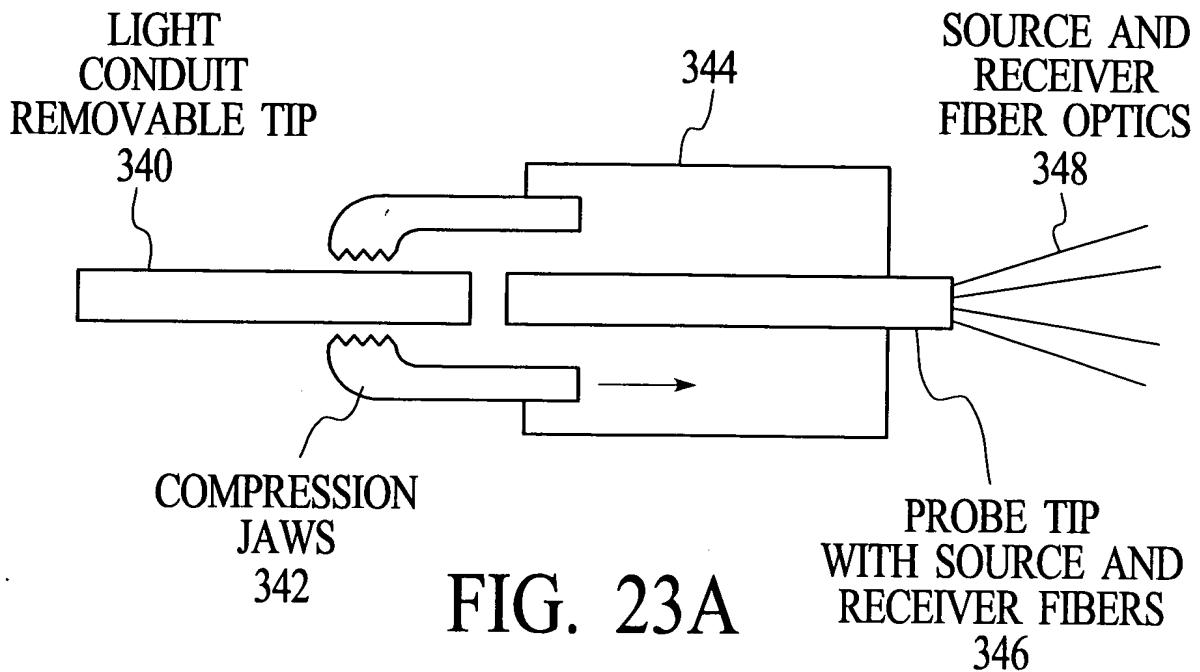
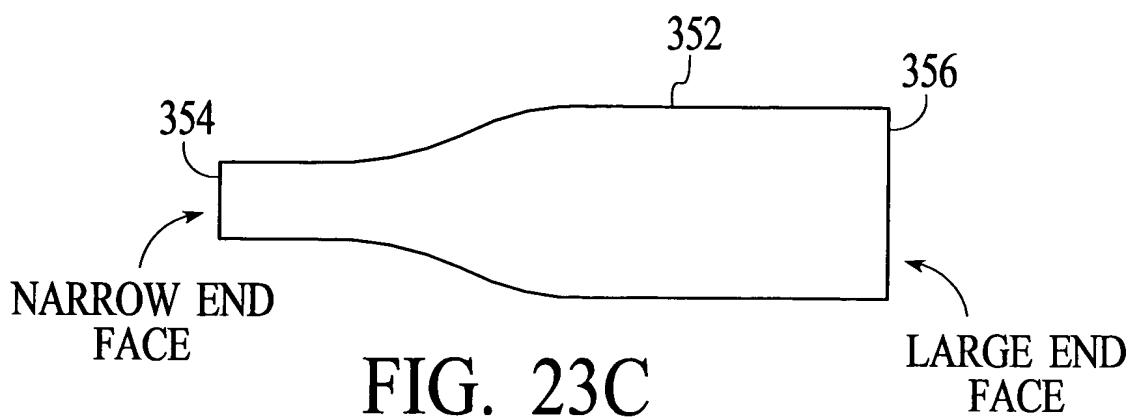
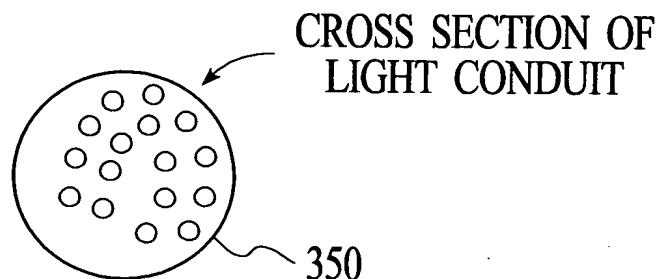


FIG. 23B



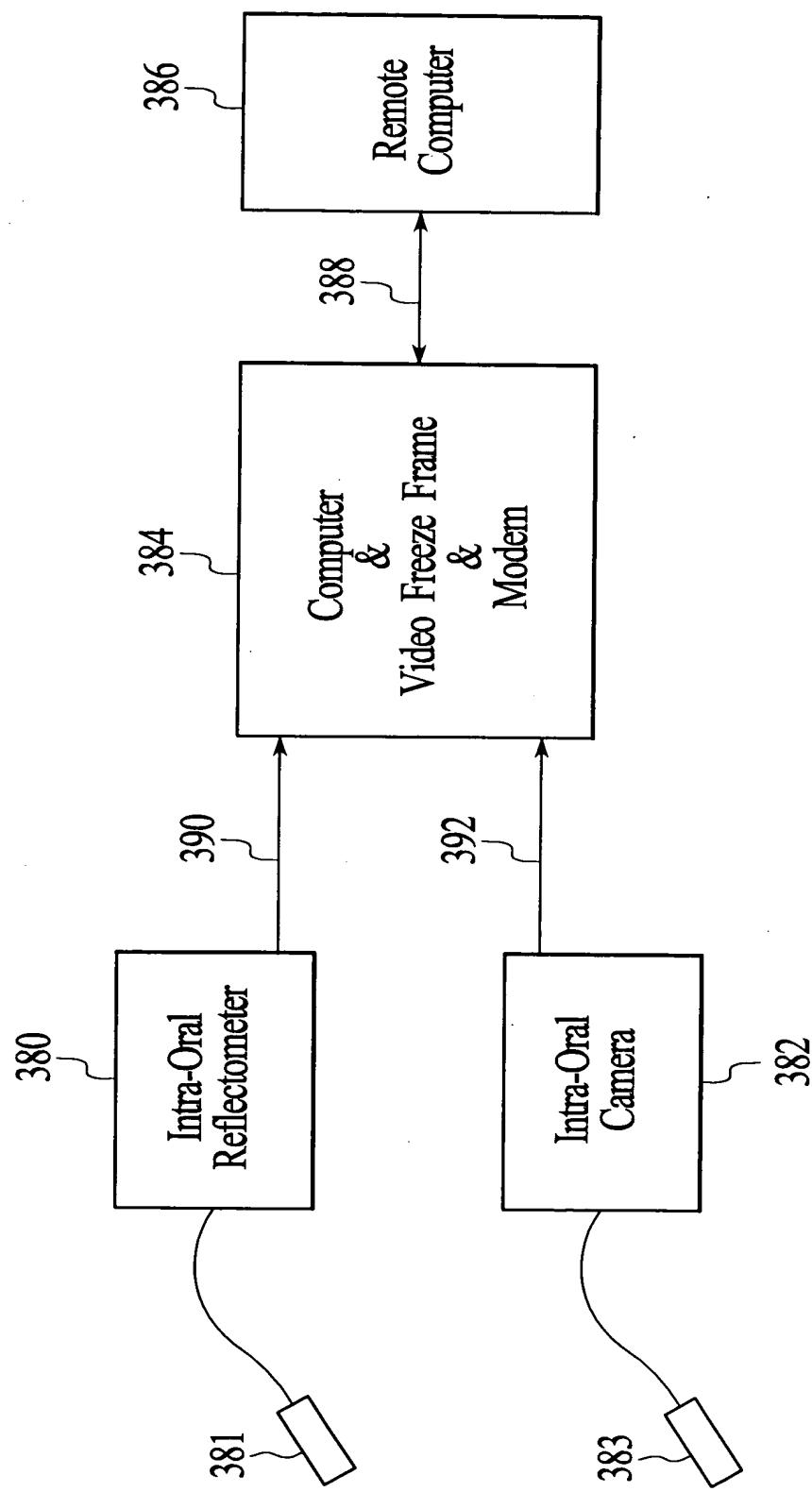


FIG. 24

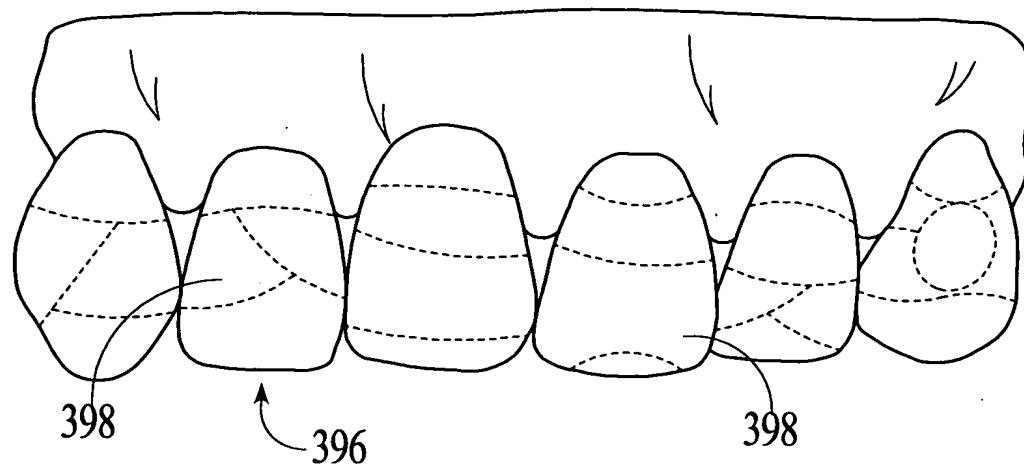


FIG. 25

20030525_001.tif

VIDEO IMAGE

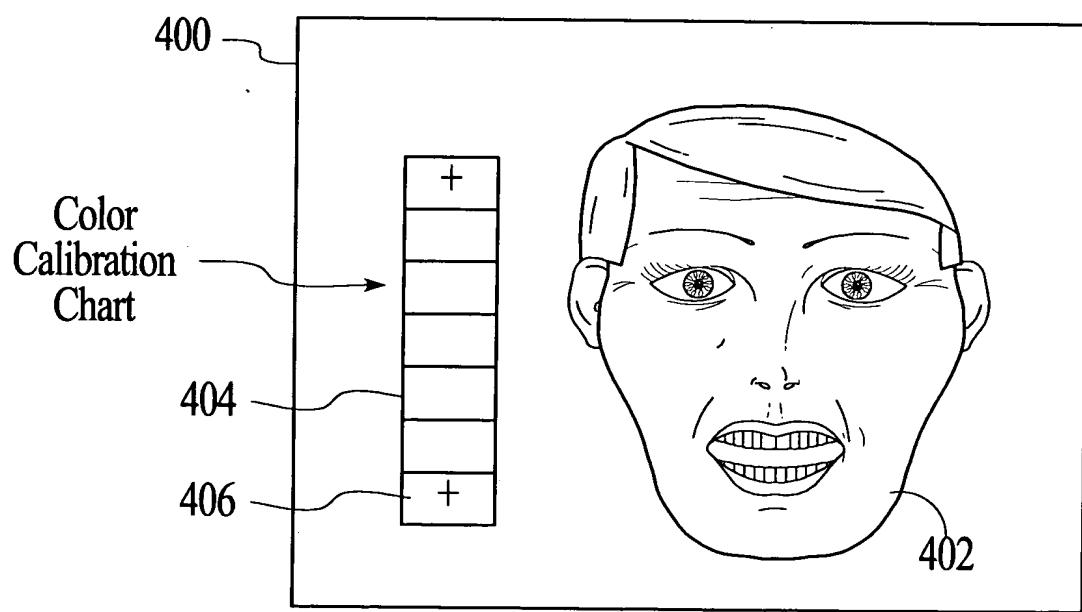


FIG. 26

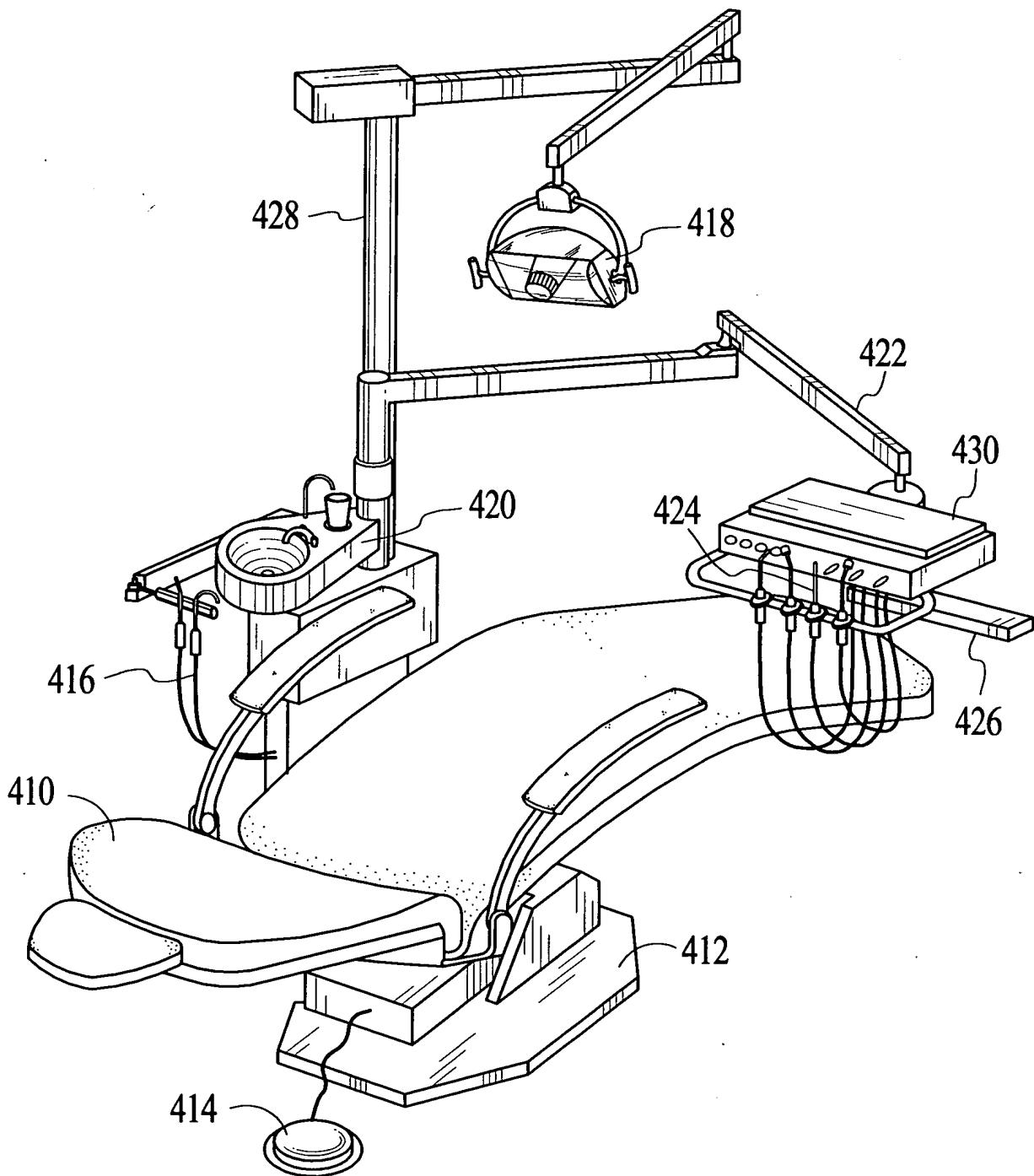


FIG. 27

3,000,000 0,000,000

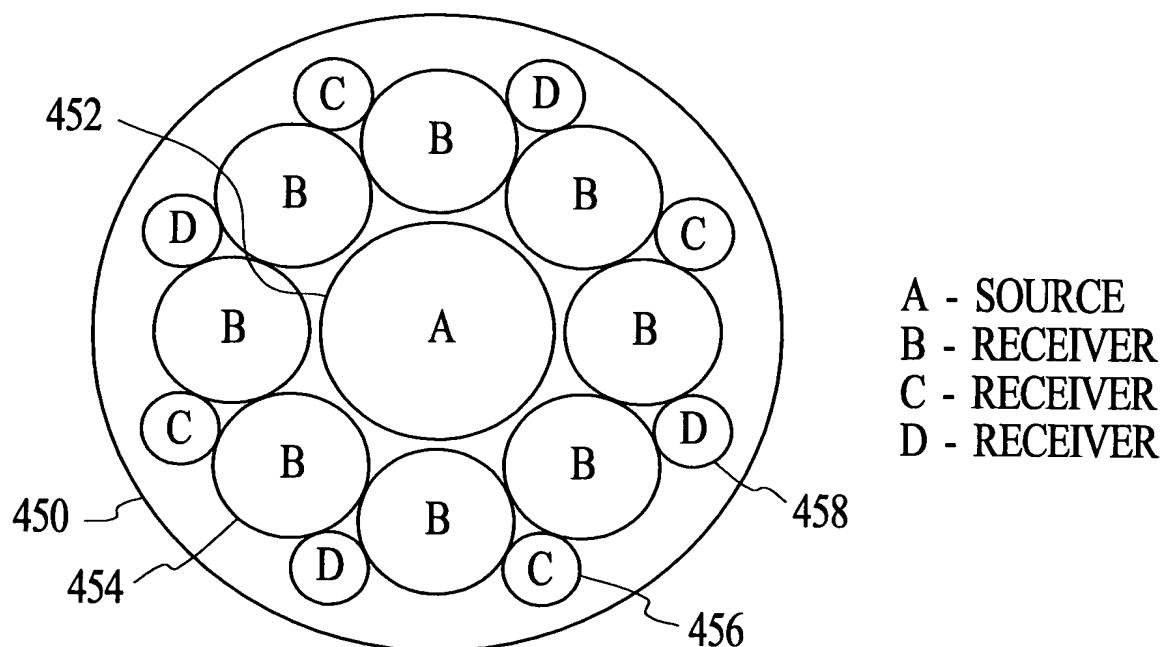


FIG. 28A

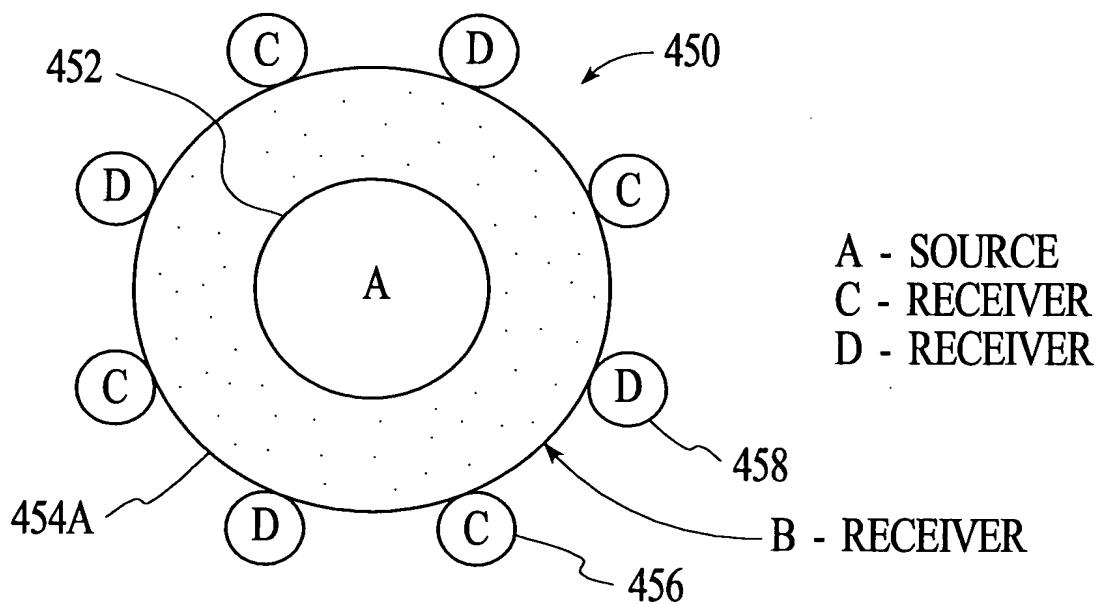


FIG. 28B

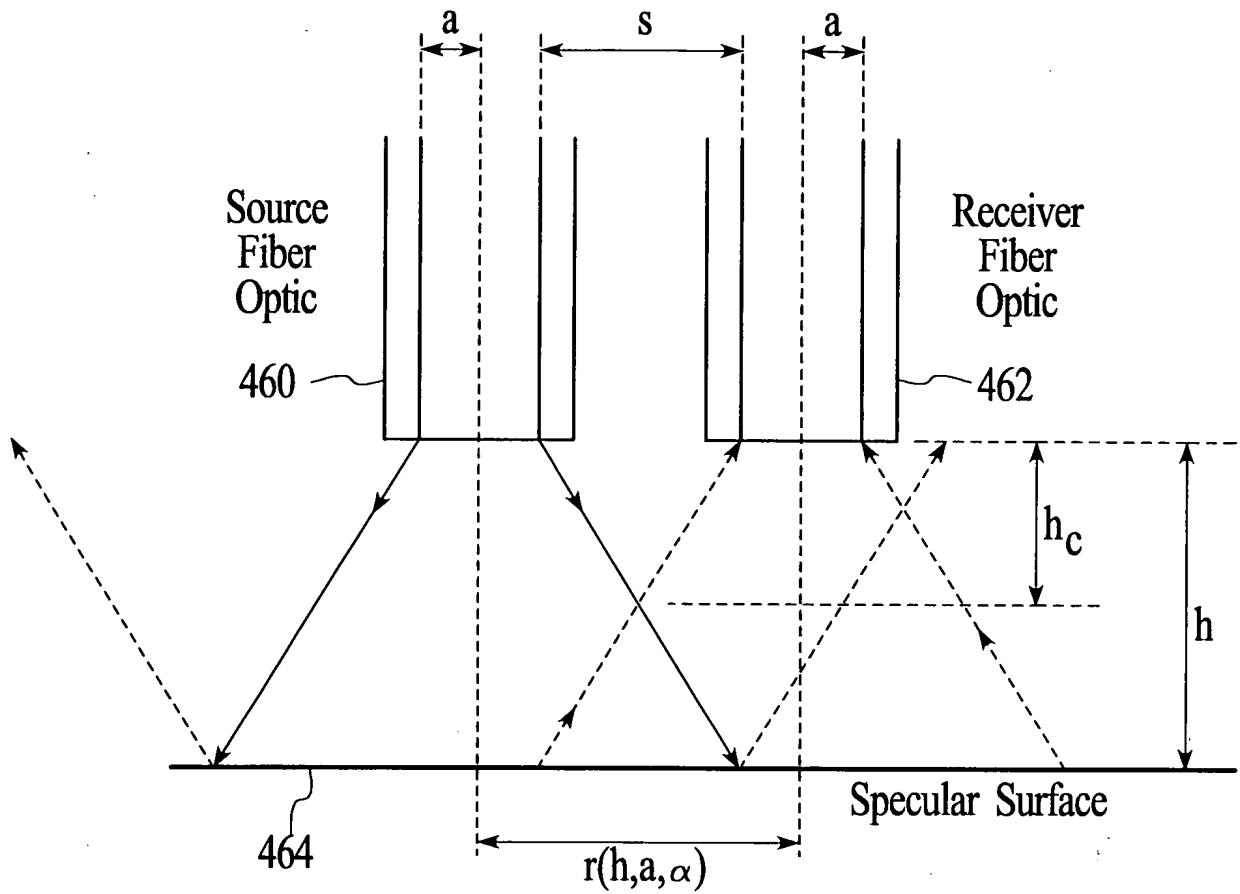


FIG. 29

FIG. 30A

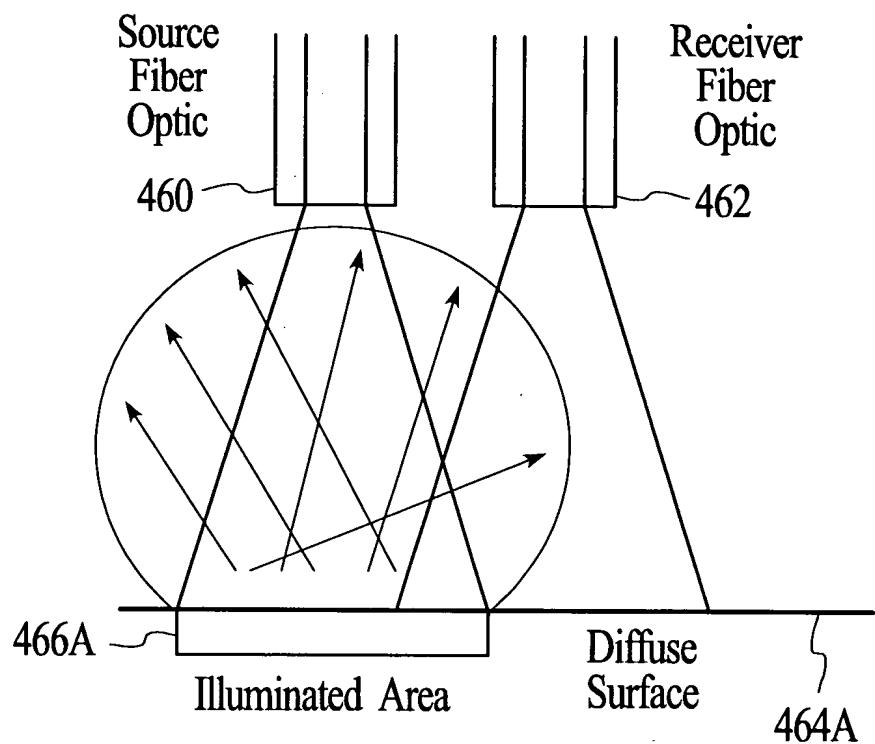
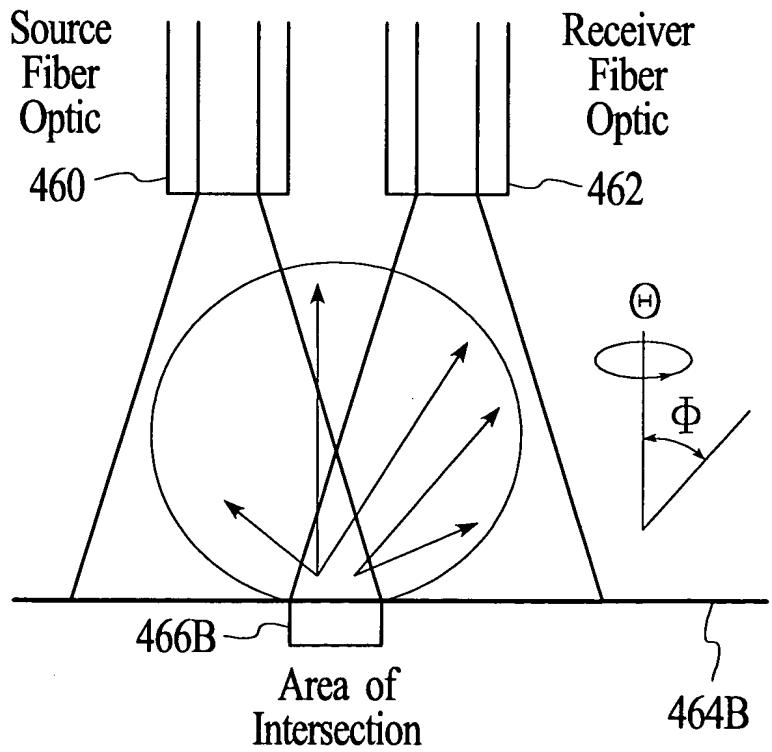


FIG. 30B



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ALL INFORMATION CONTAINED
HEREIN IS UNCLASSIFIED

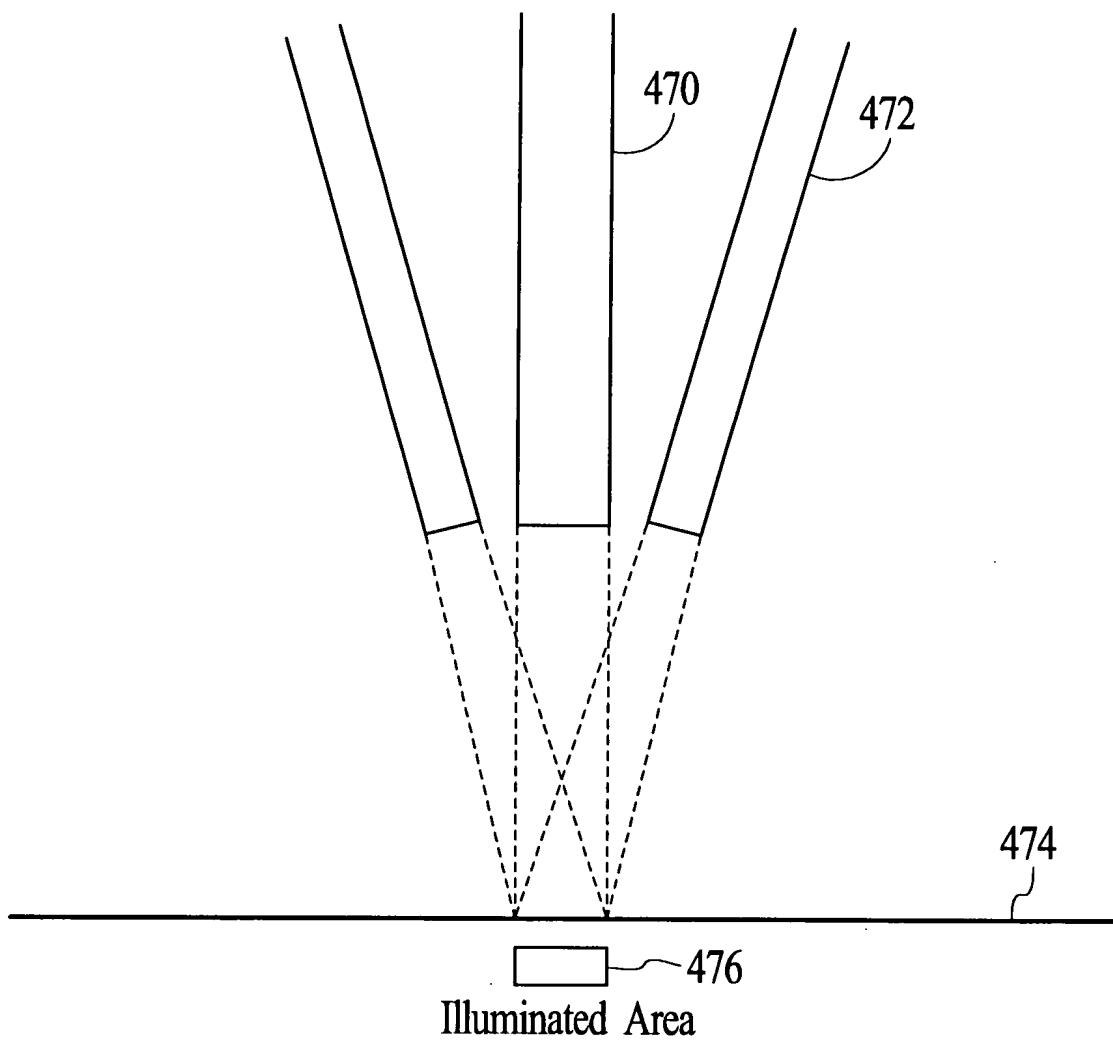


FIG. 31A

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SEARCHED SERIALIZED INDEXED
2005-06-01

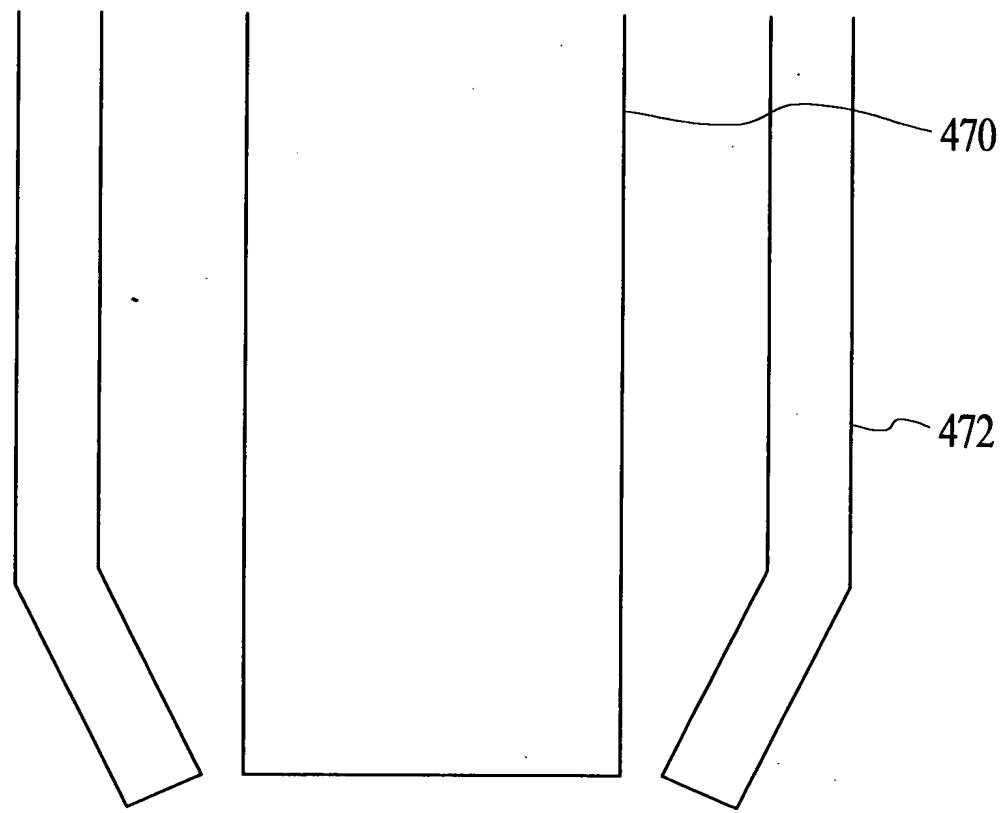


FIG. 31B

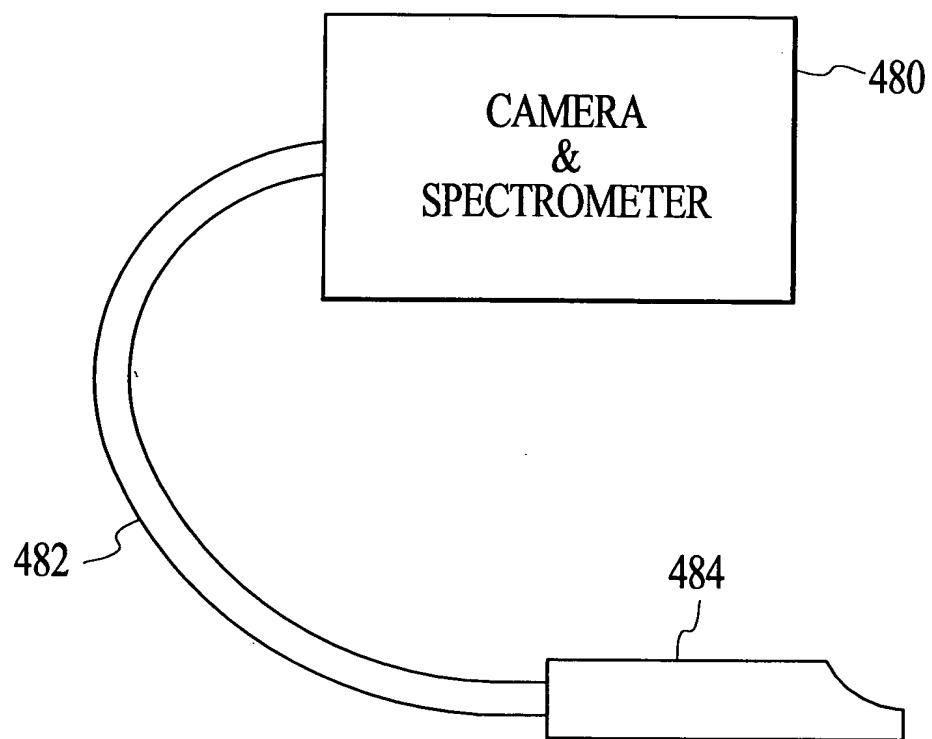


FIG. 32

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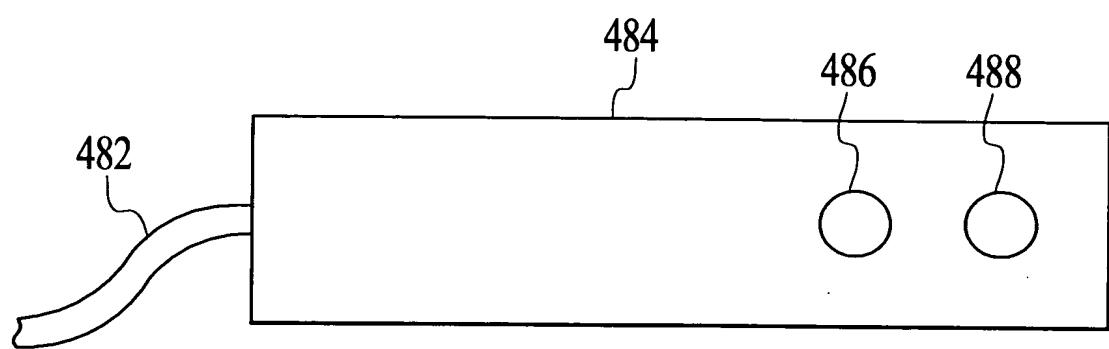


FIG. 33

1000 COPIES ORDERED

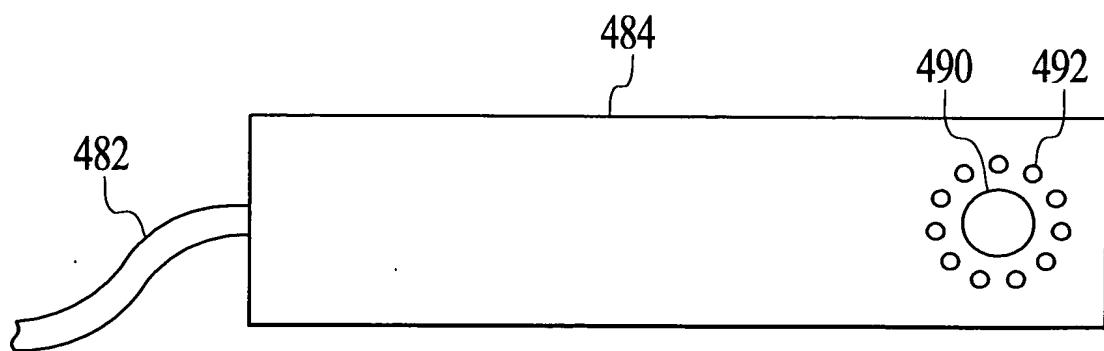


FIG. 34

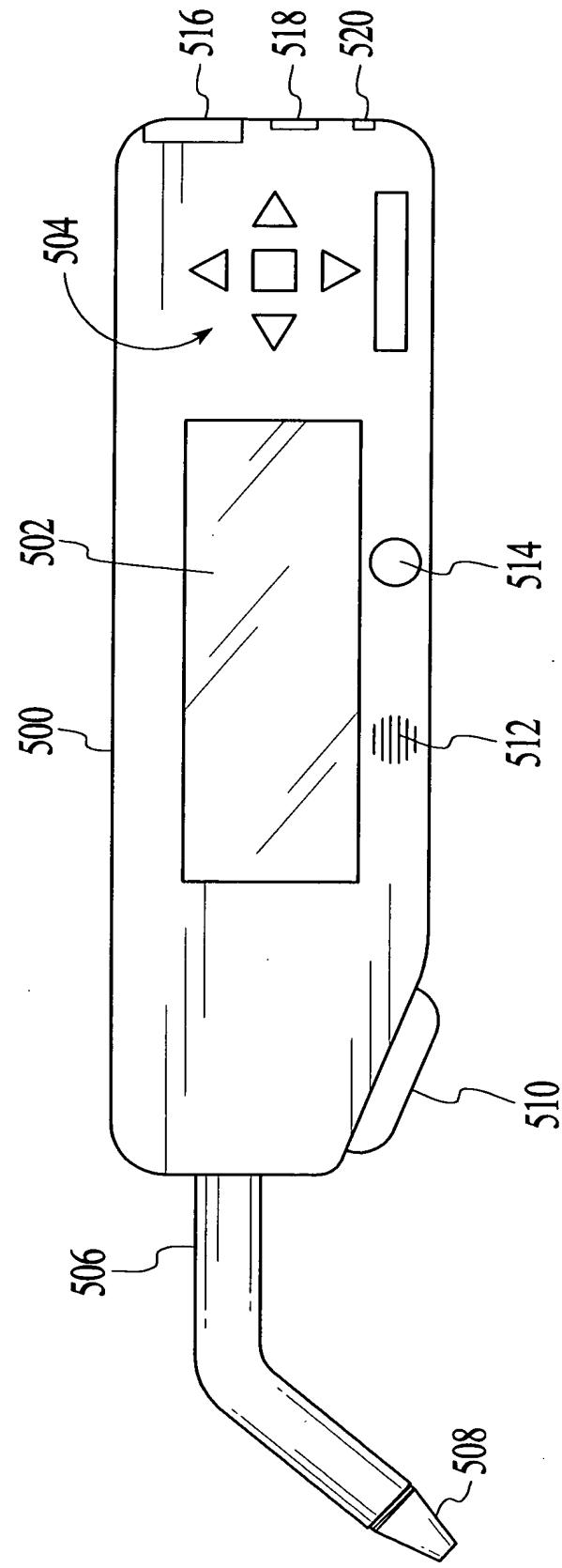
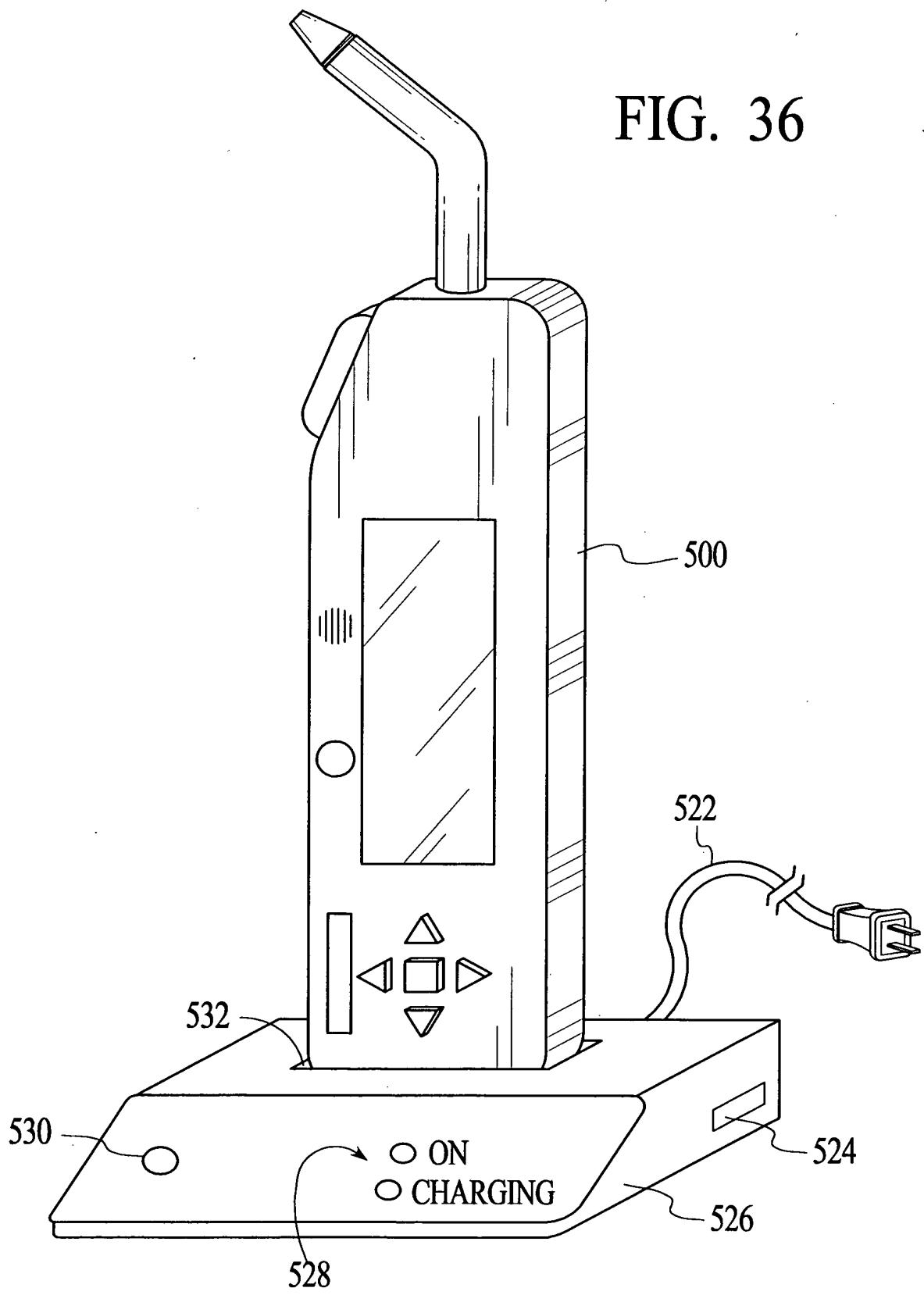
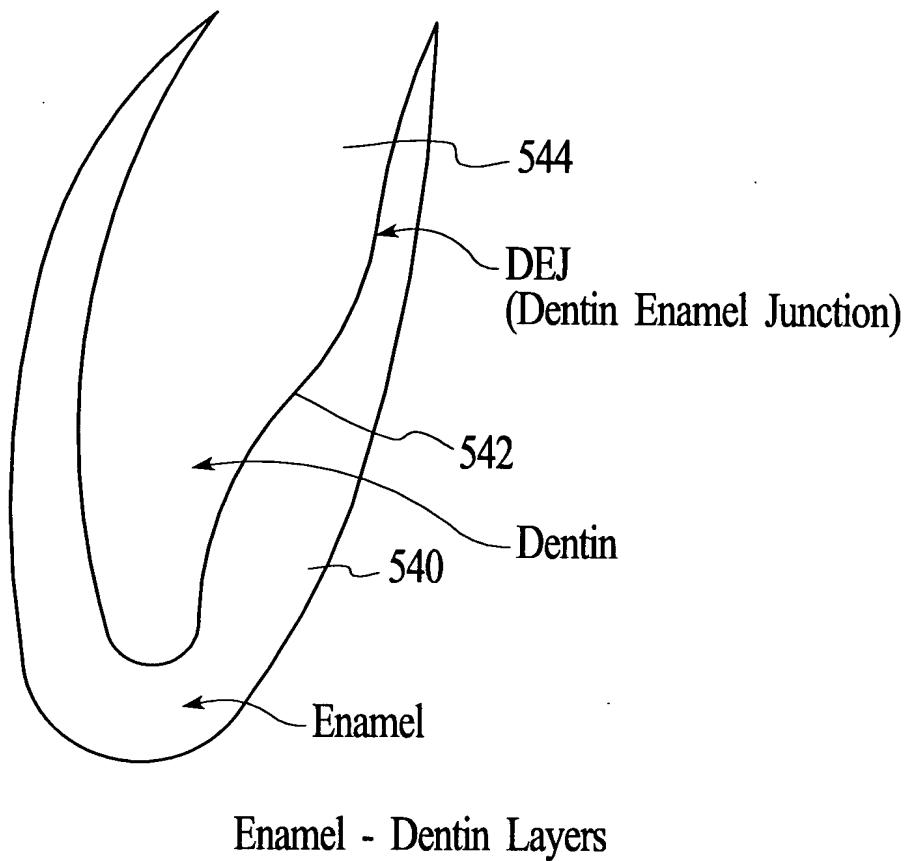


FIG. 35

FIG. 36





LIGHT REFLECTION AND SCATTERING

FIG. 37A

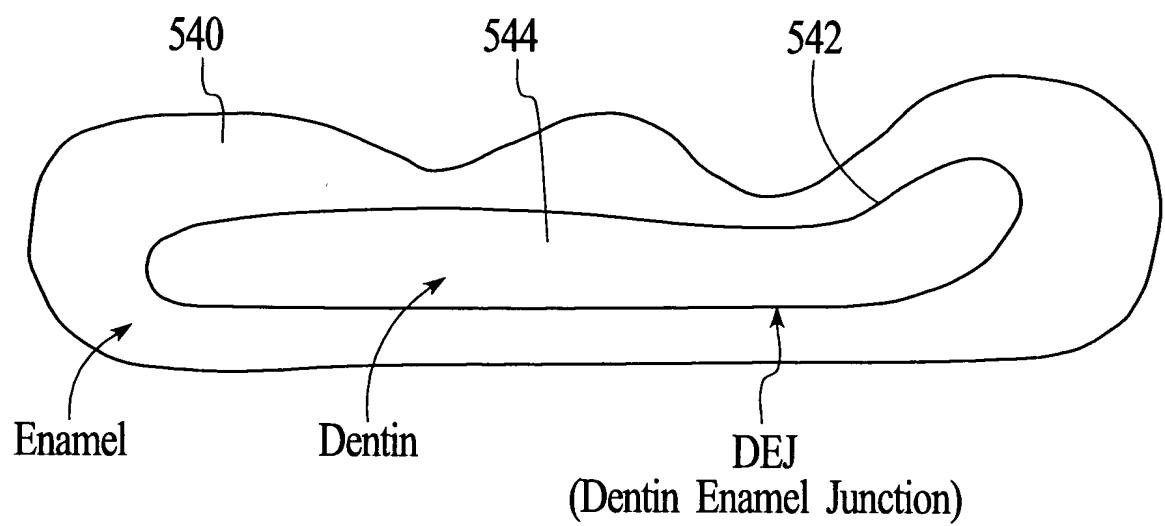
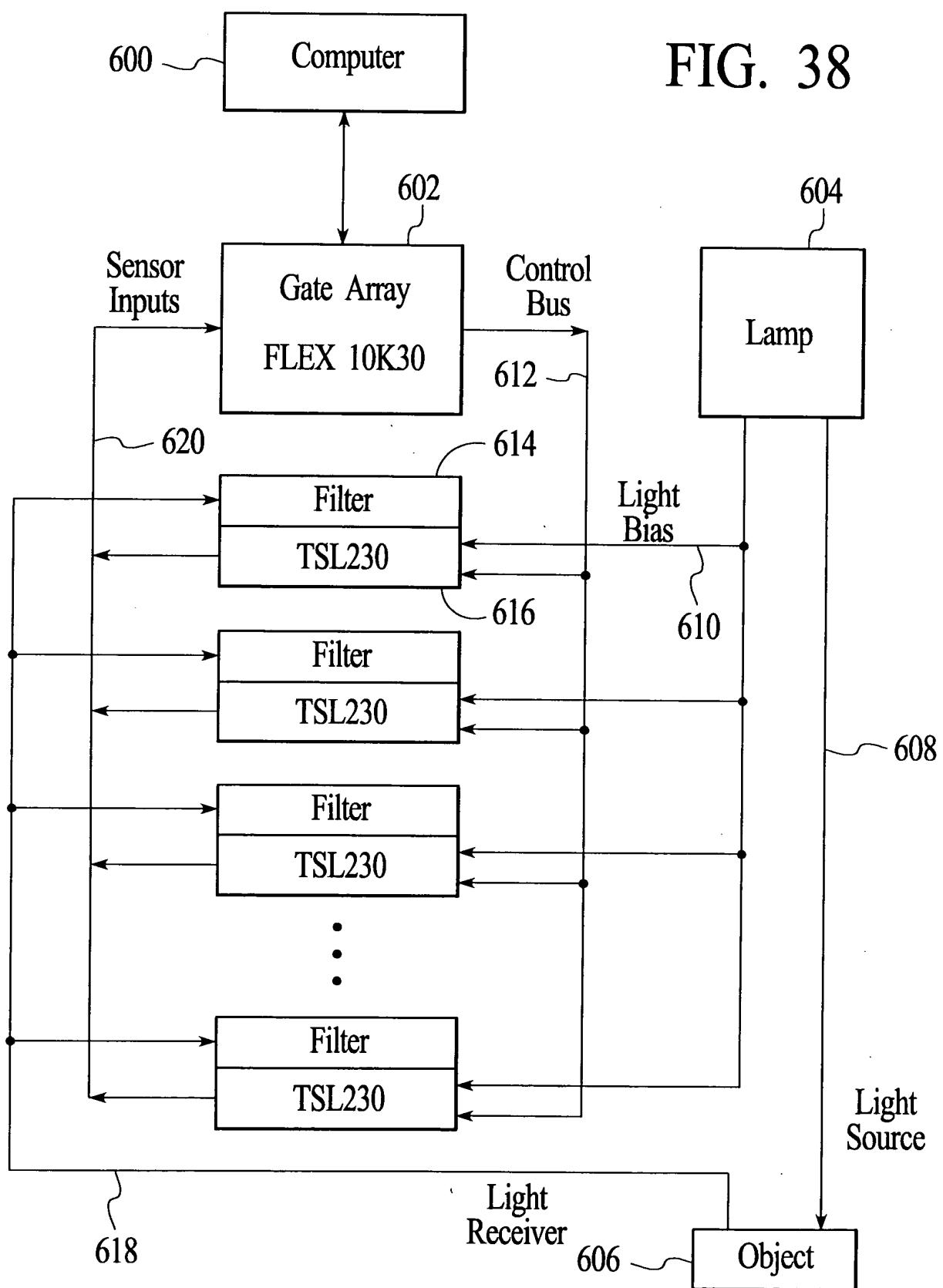


FIG. 37B

FIG. 38



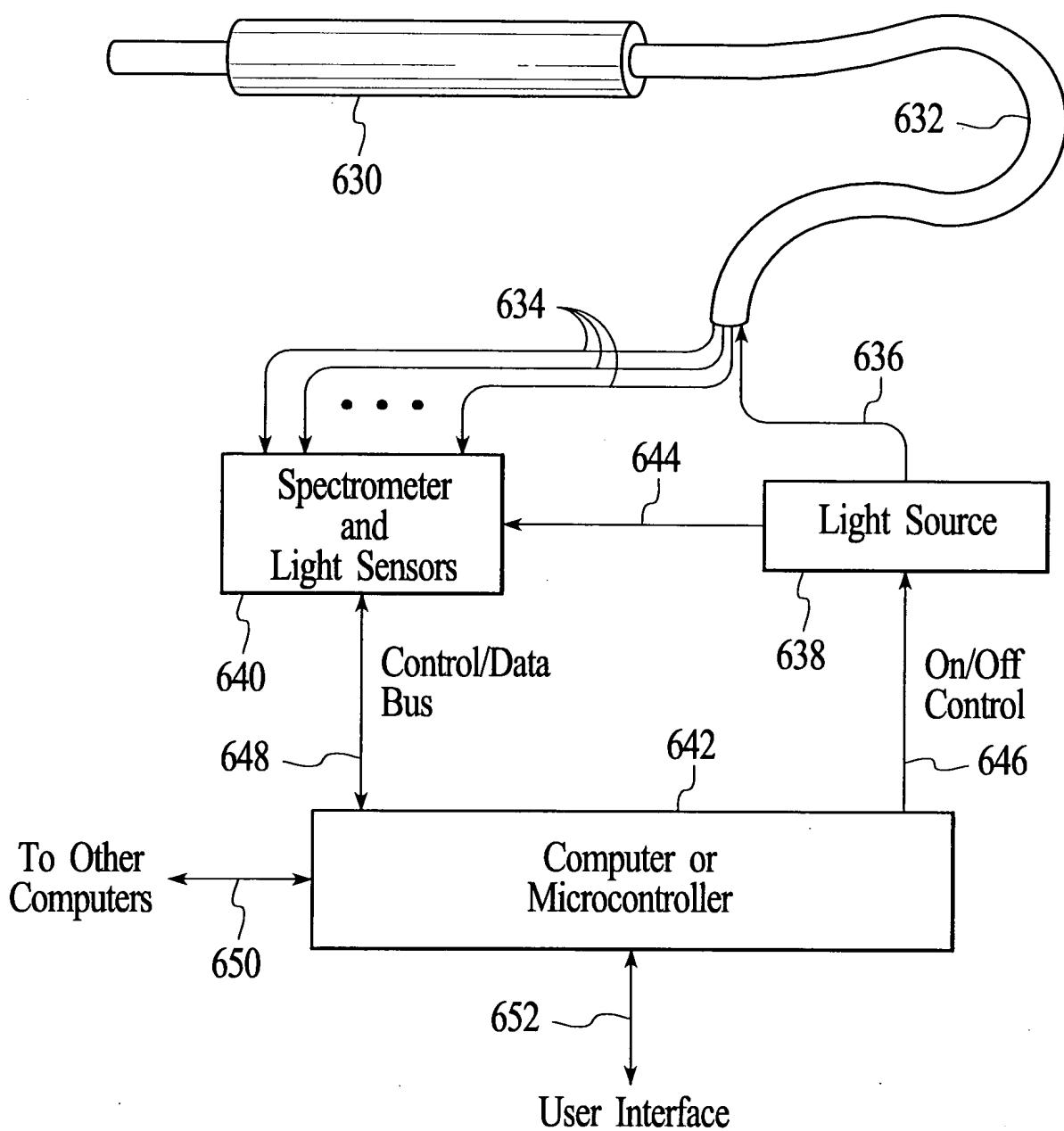


FIG. 39

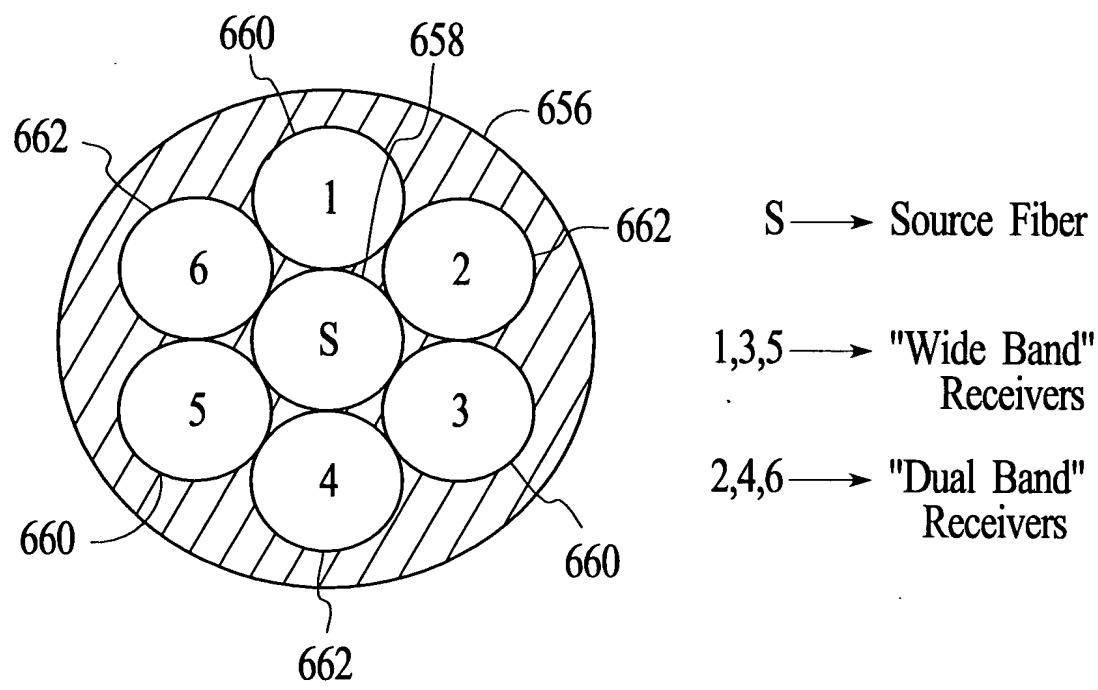


FIG. 40

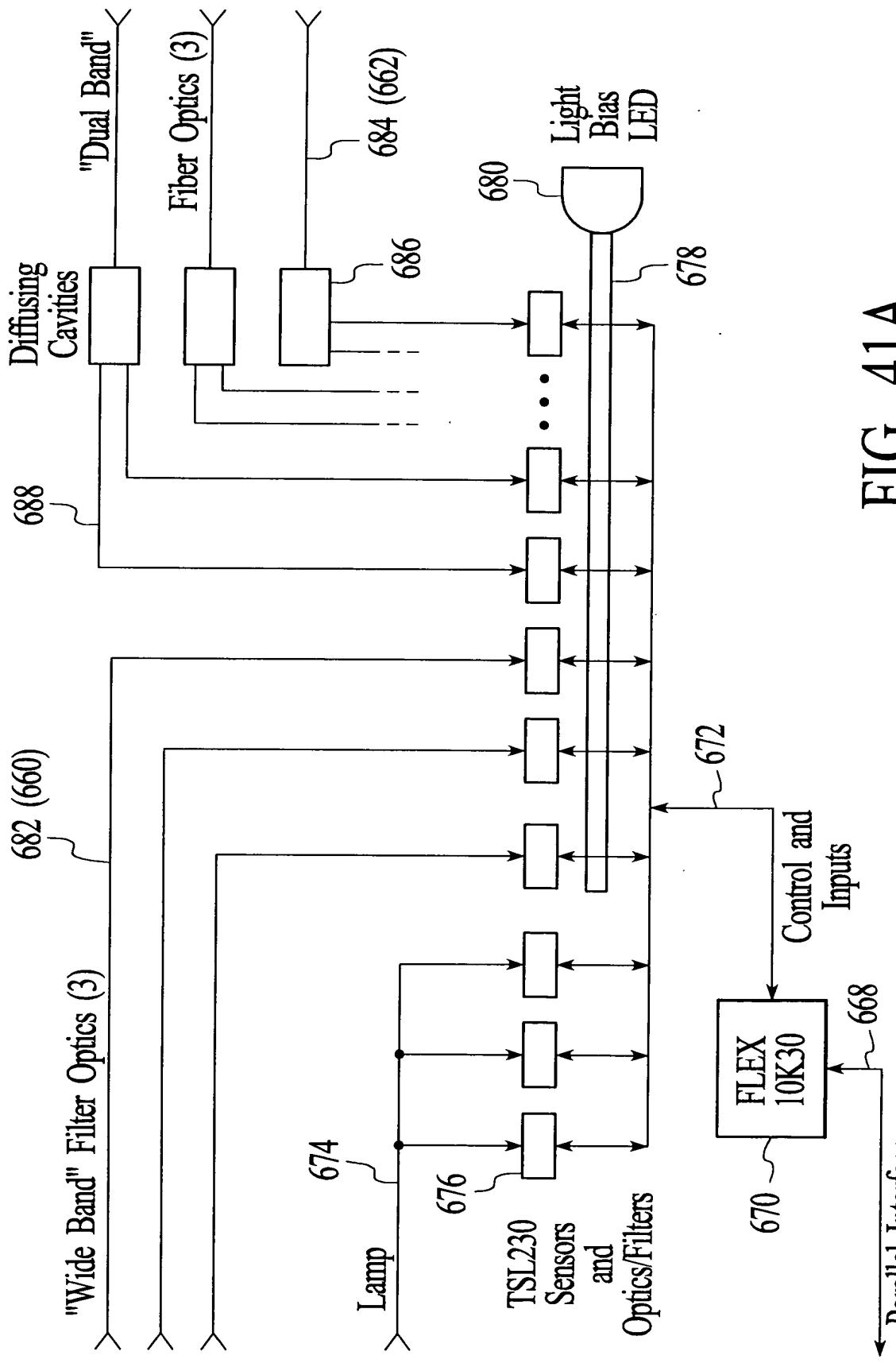


FIG. 41A

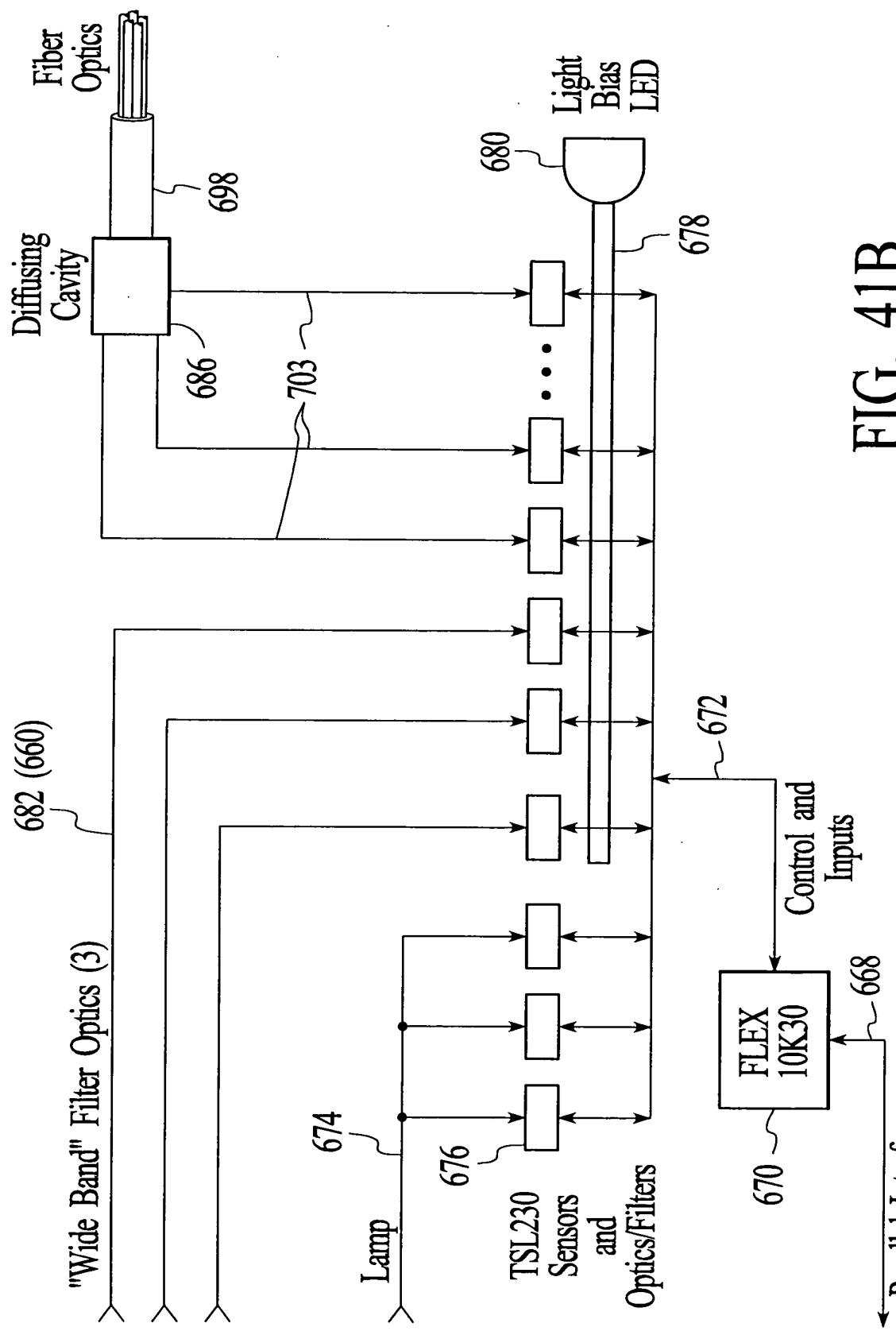


FIG. 41B

10039205 03.04.2023

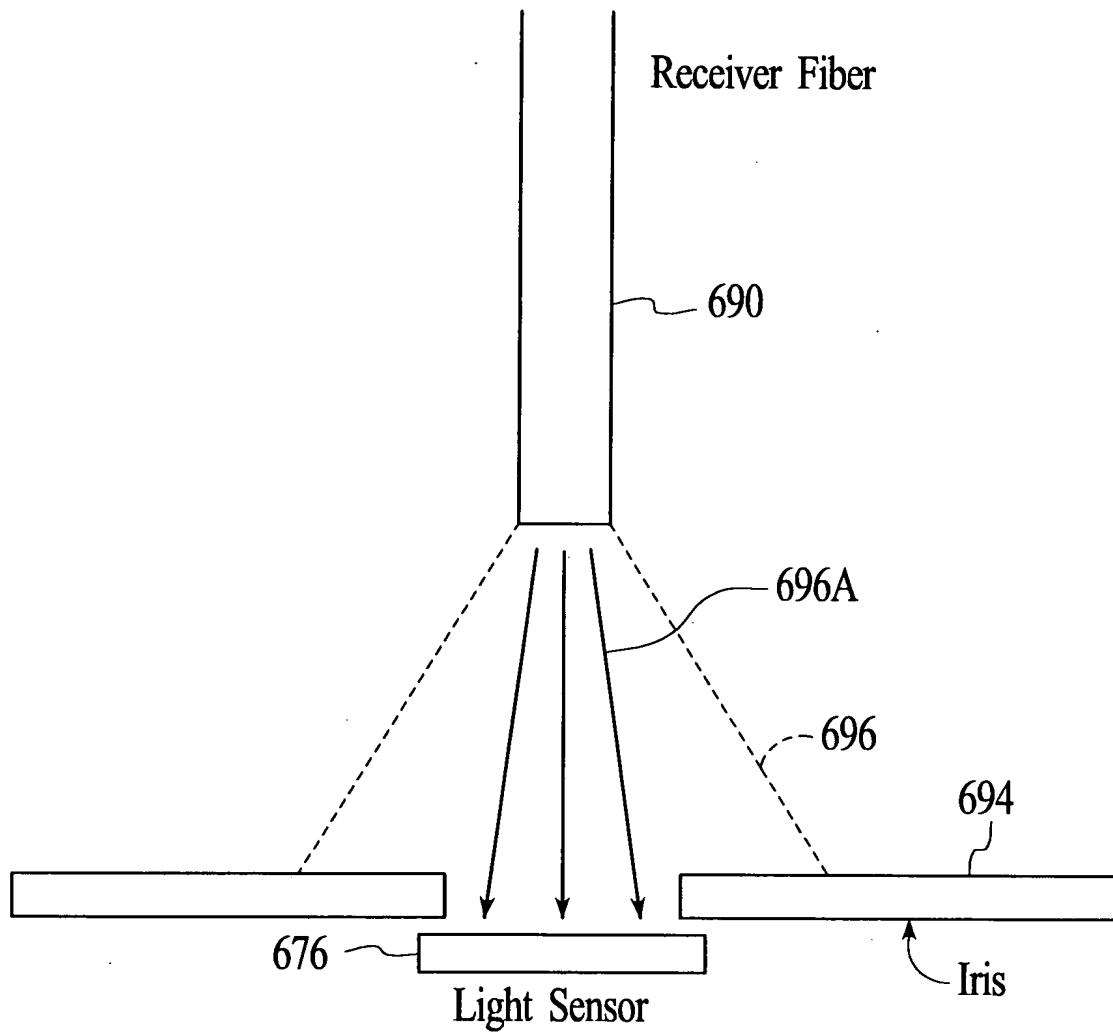


FIG. 42

Diffusing Cavity

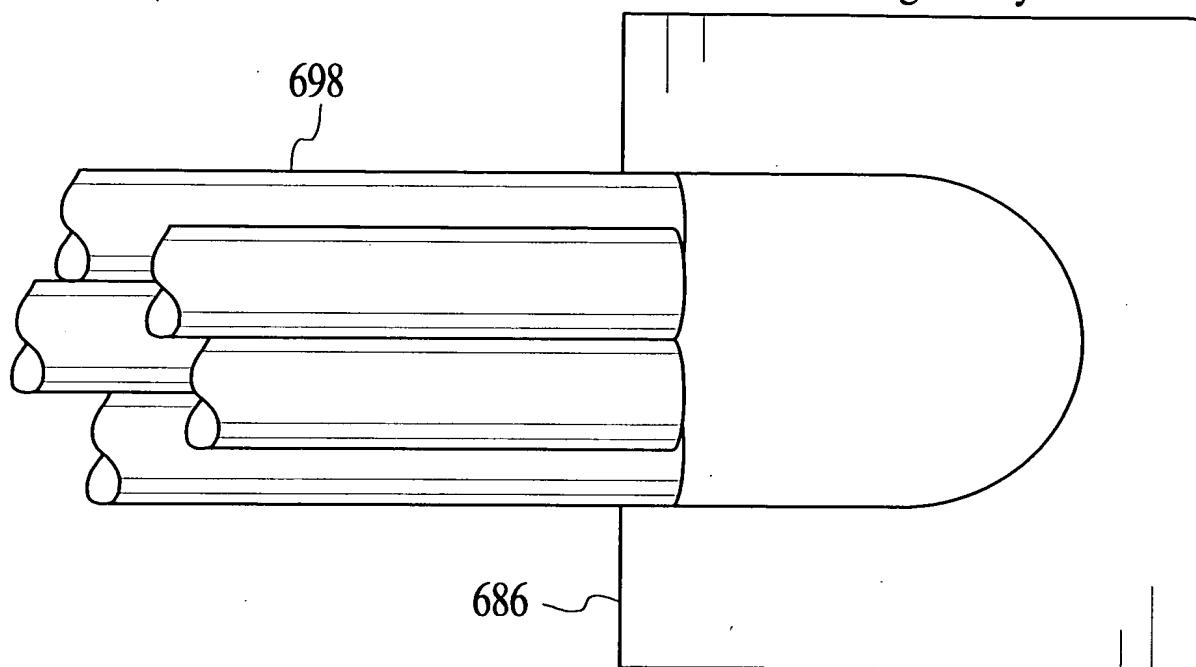


FIG. 43A

2010362053400

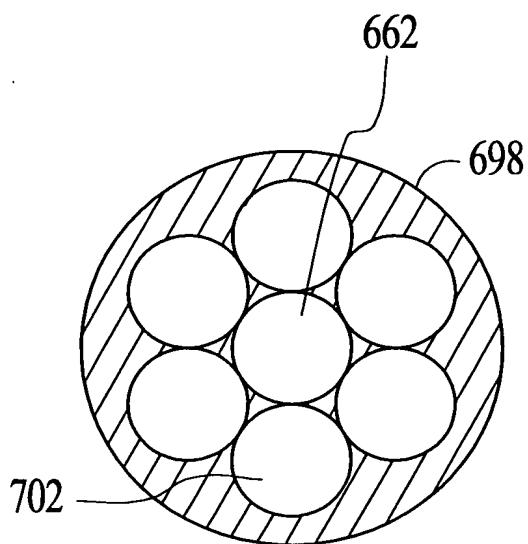


FIG. 43B

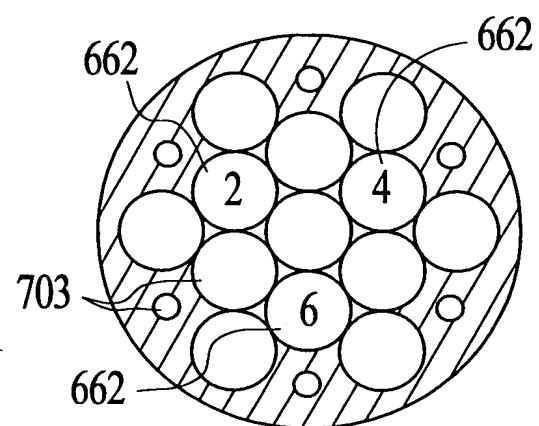


FIG. 43C

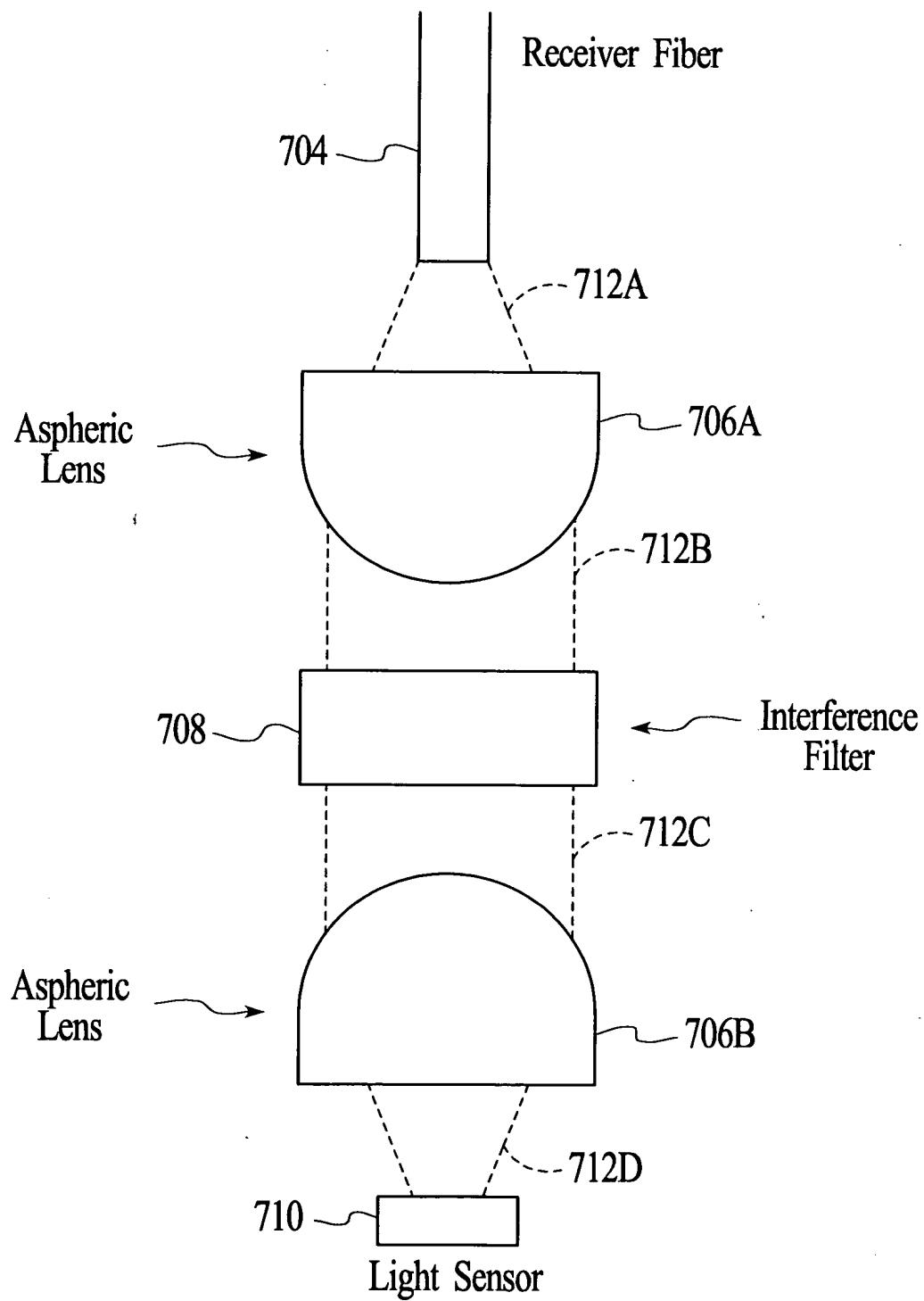


FIG. 44

PRINTED IN U.S.A. 1970

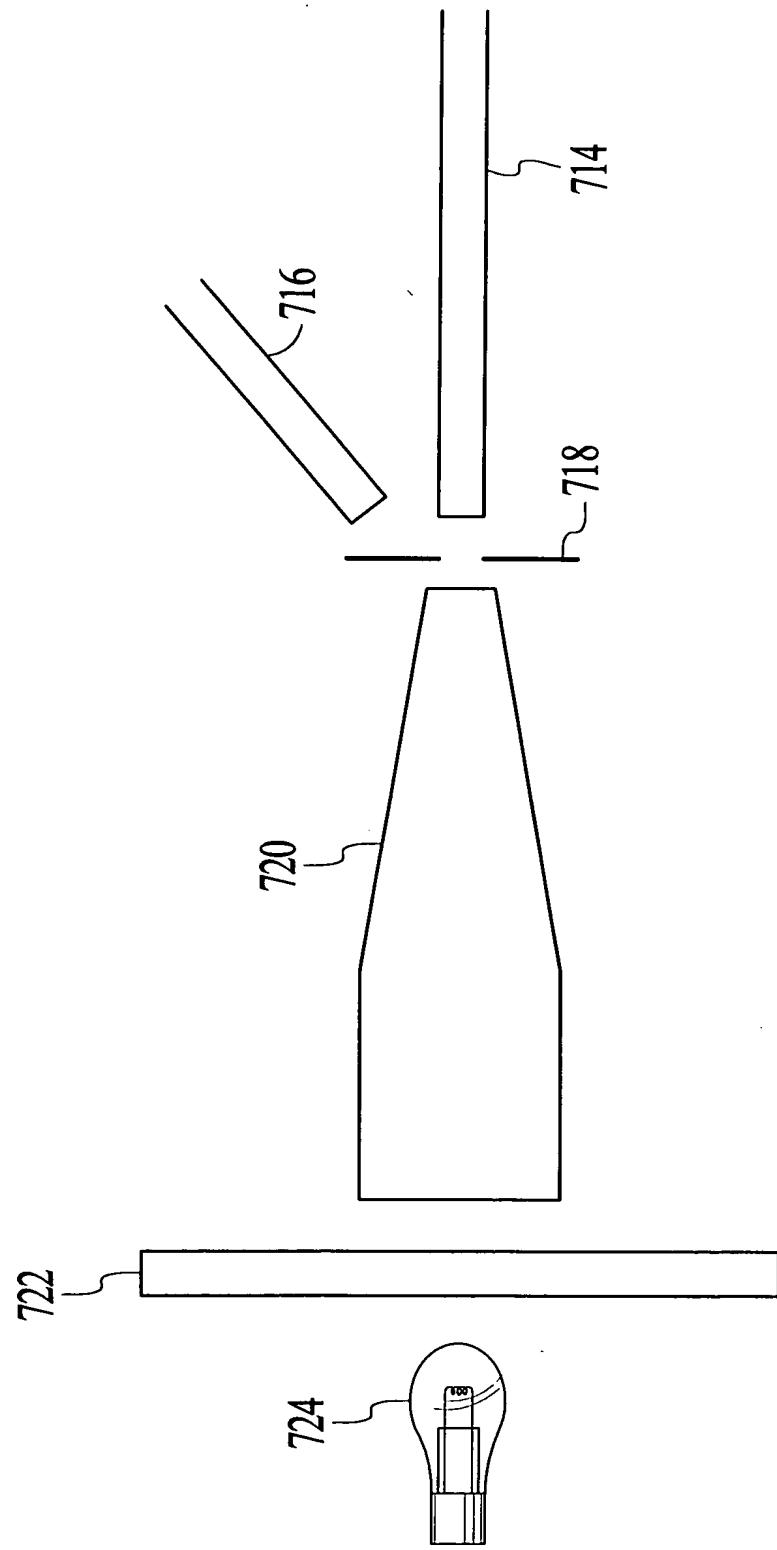


FIG. 45

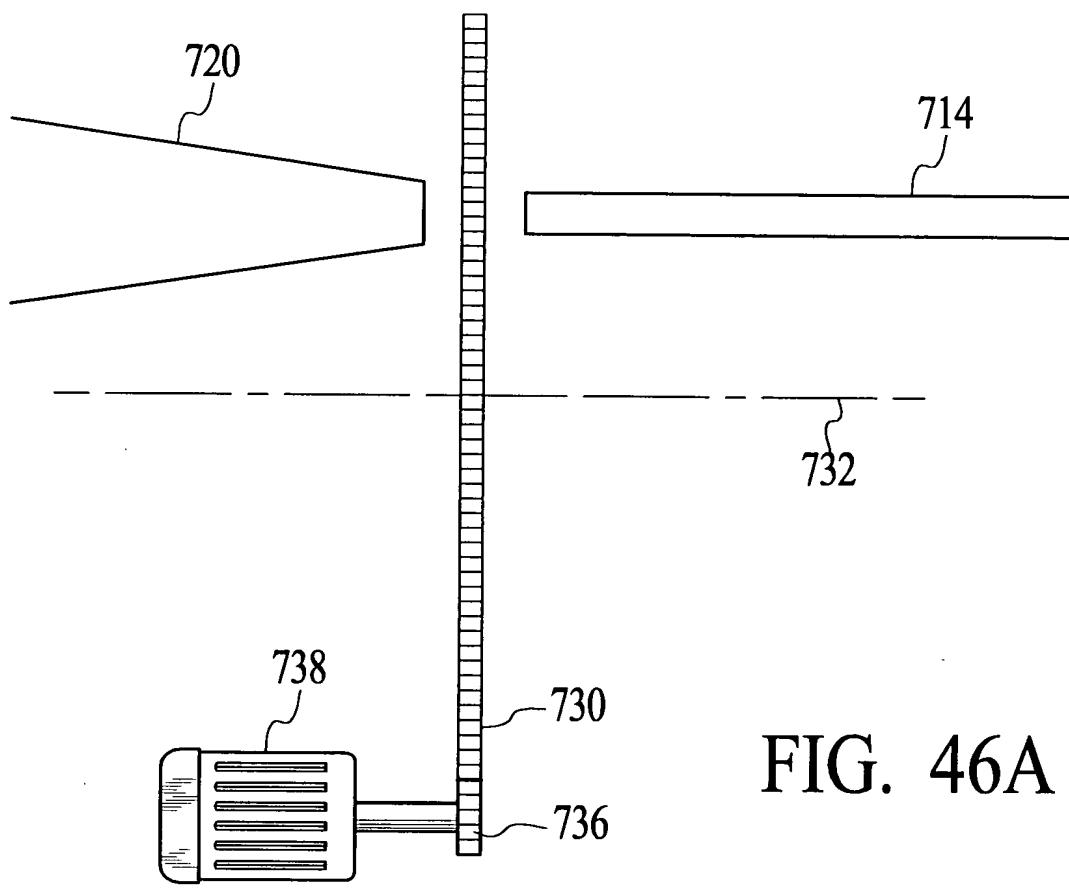


FIG. 46A

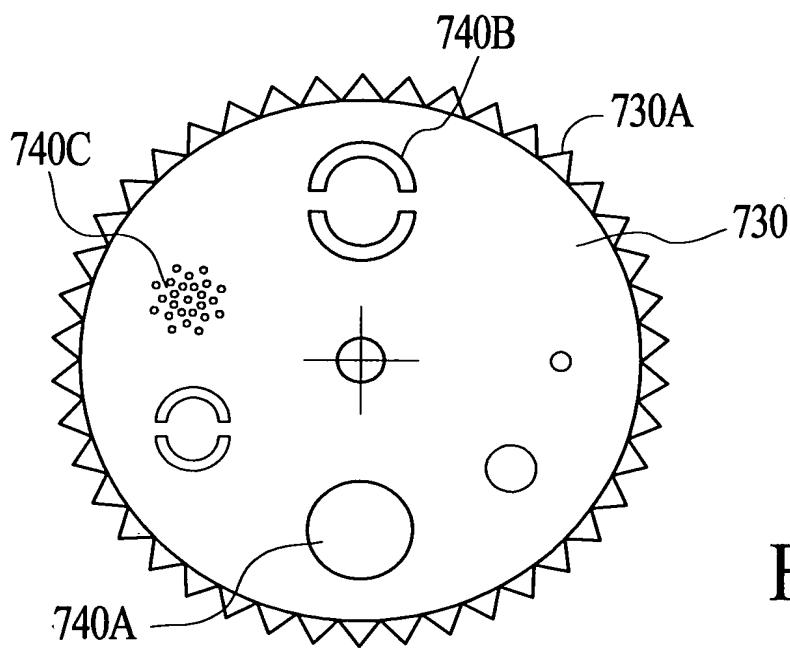


FIG. 46B

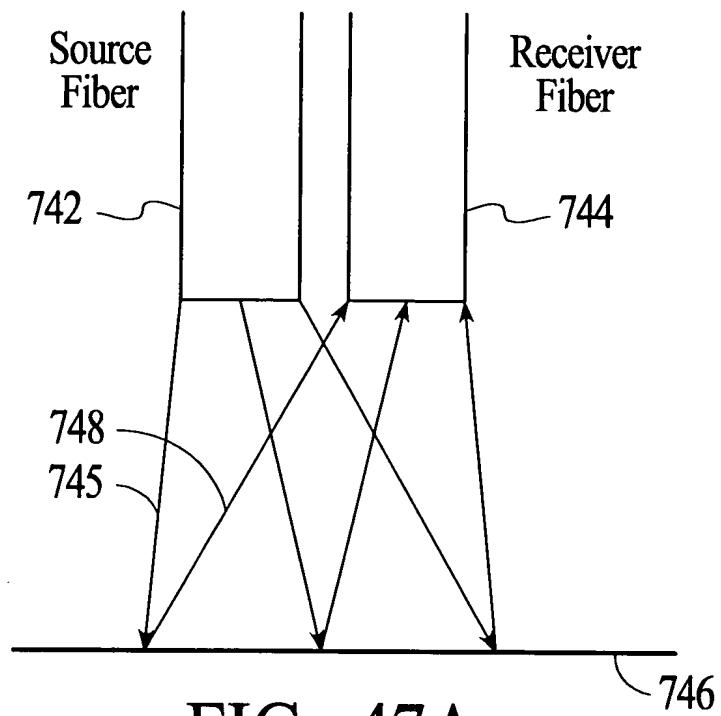


FIG. 47A

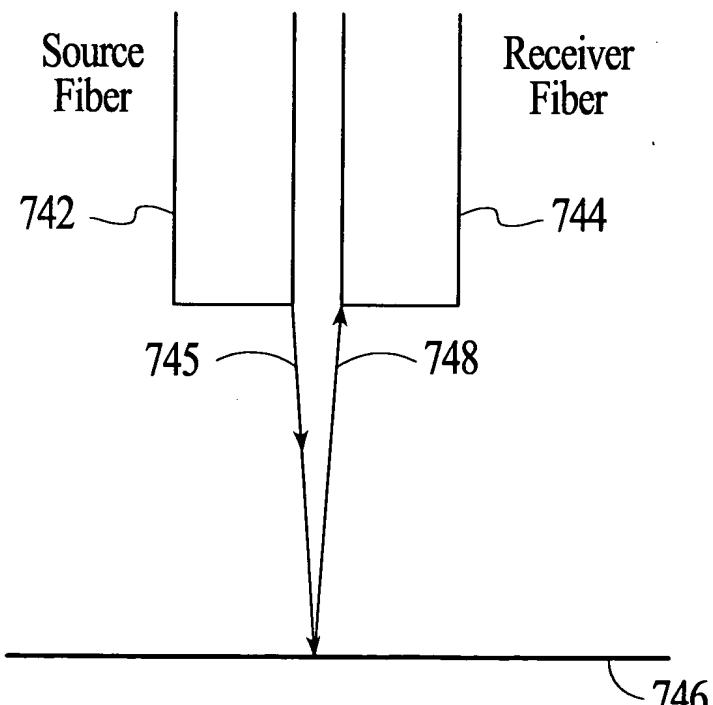


FIG. 47B

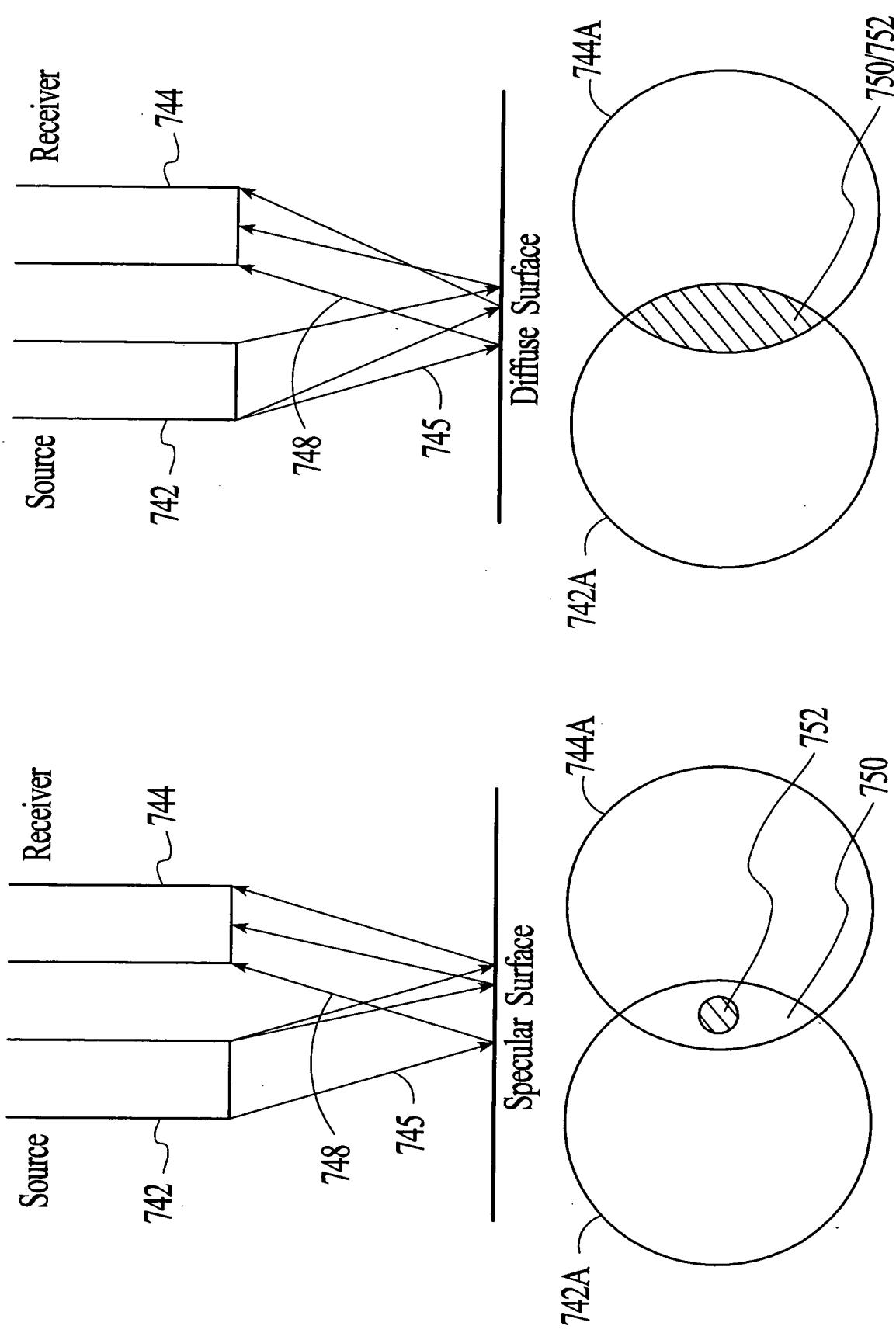


FIG. 48A

FIG. 48B

20140107-20263000

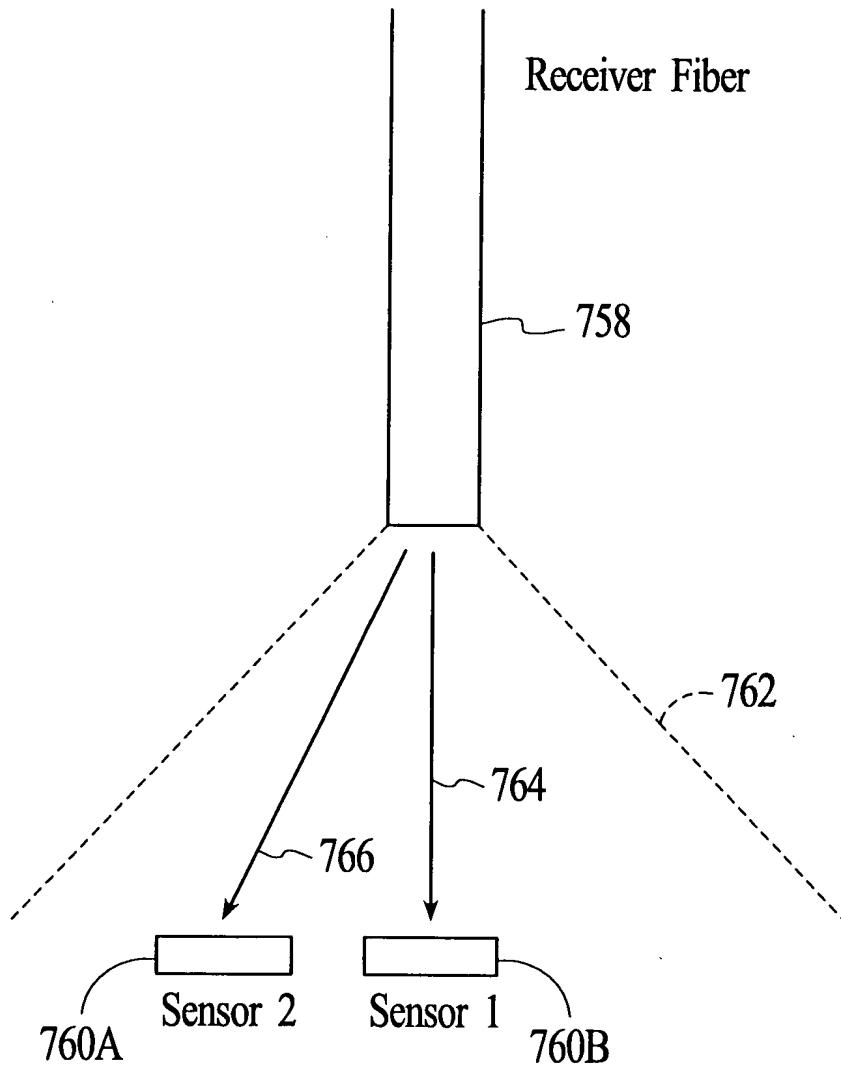


FIG. 49

INTENSITY SPECULAR

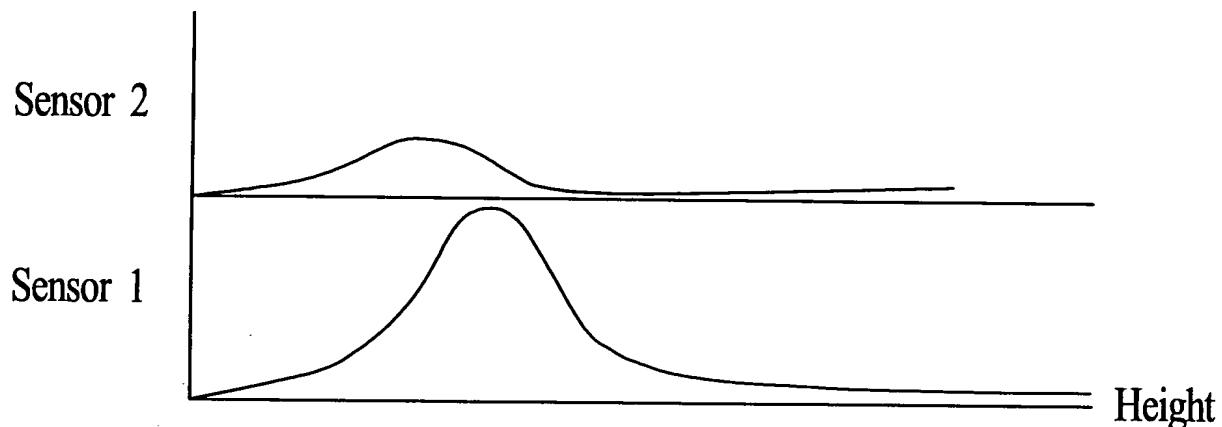


FIG. 50A

PROBLEMS - PRACTICE

INTENSITY DIFFUSE

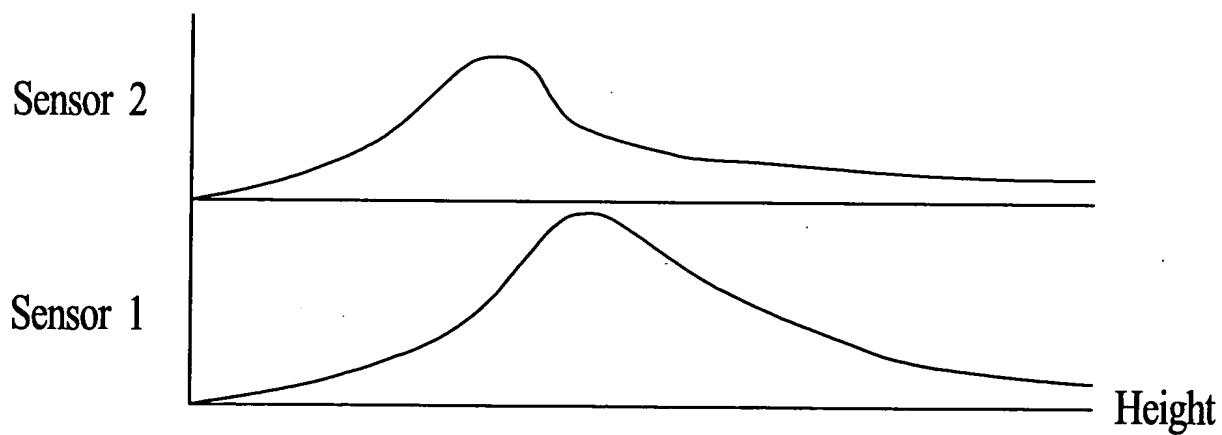
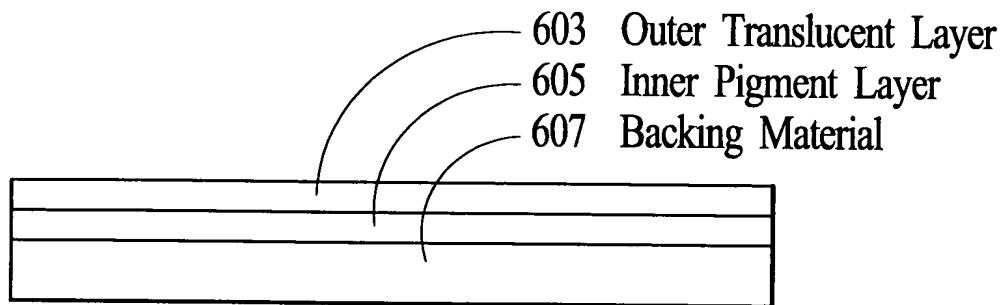


FIG. 50B



601

FIG. 51A

2025 RELEASE UNDER E.O. 14176

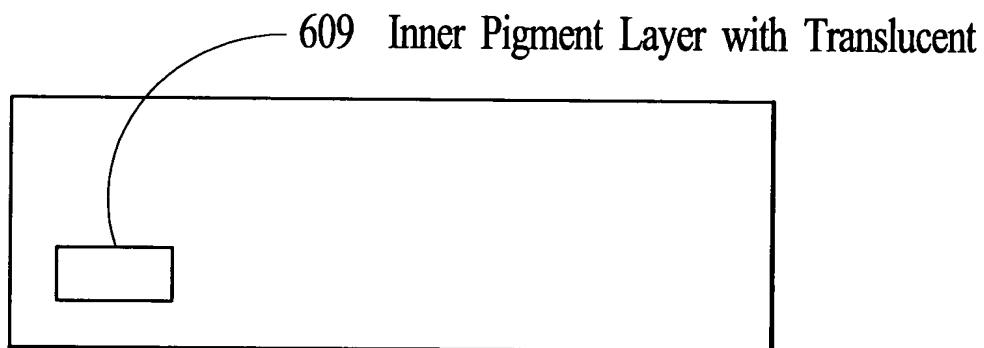
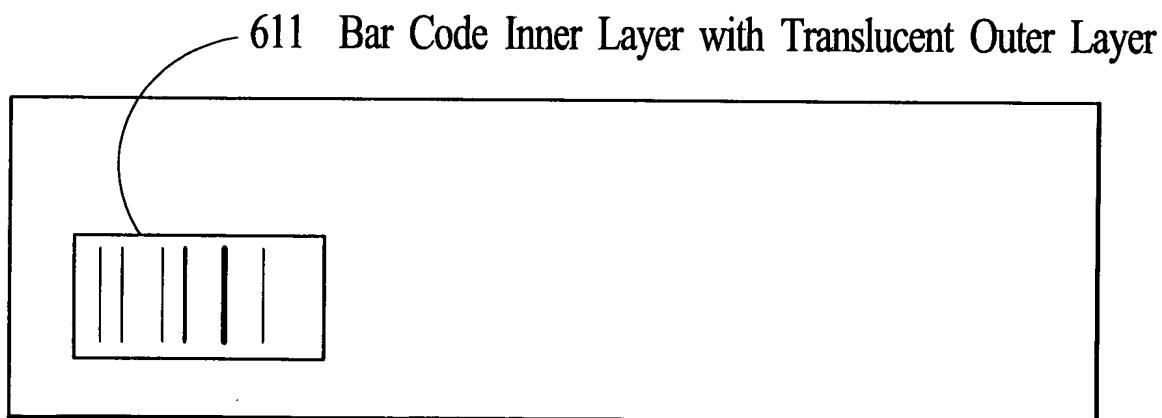


FIG. 51B



601

FIG. 51C

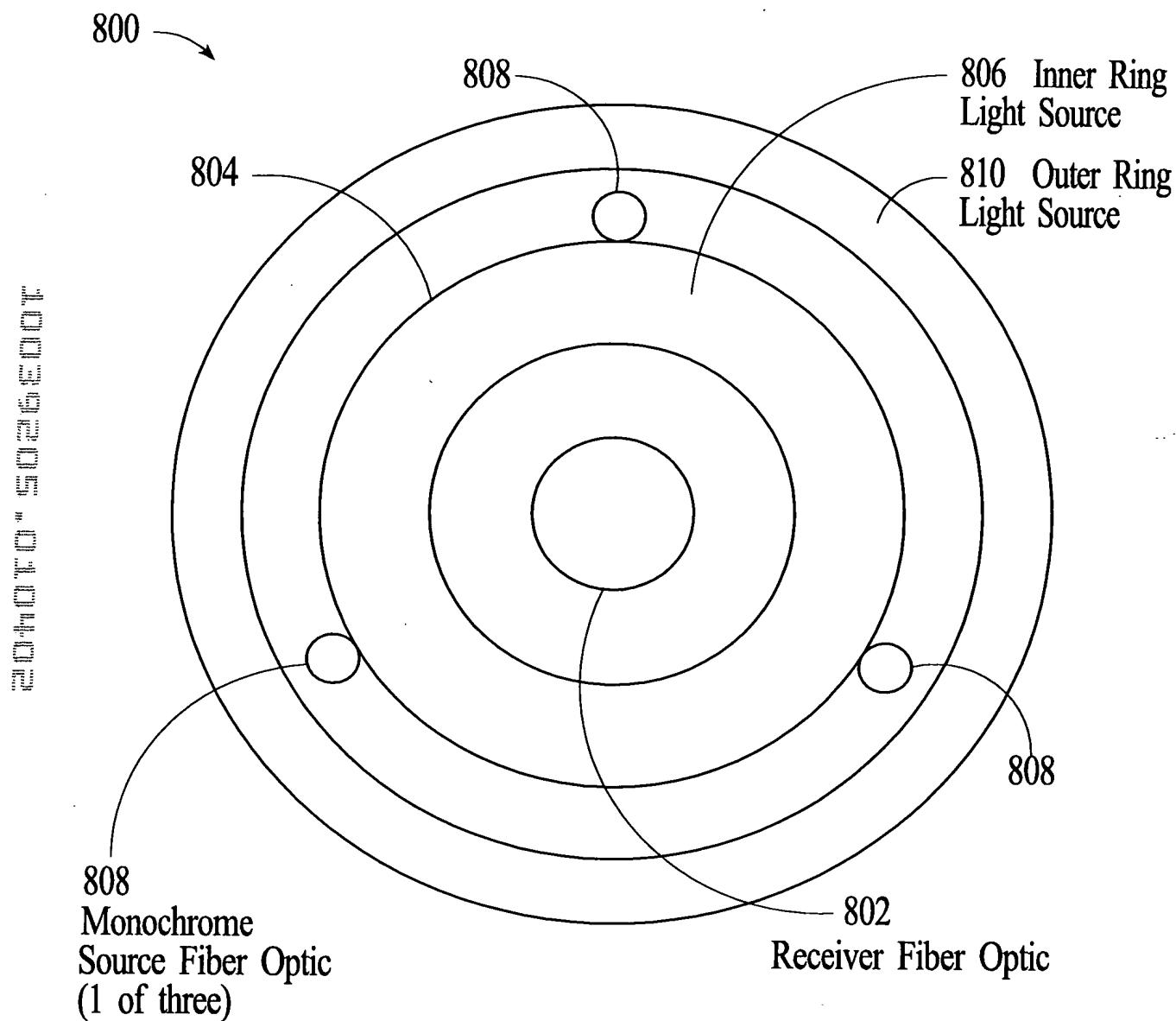


FIG. 52

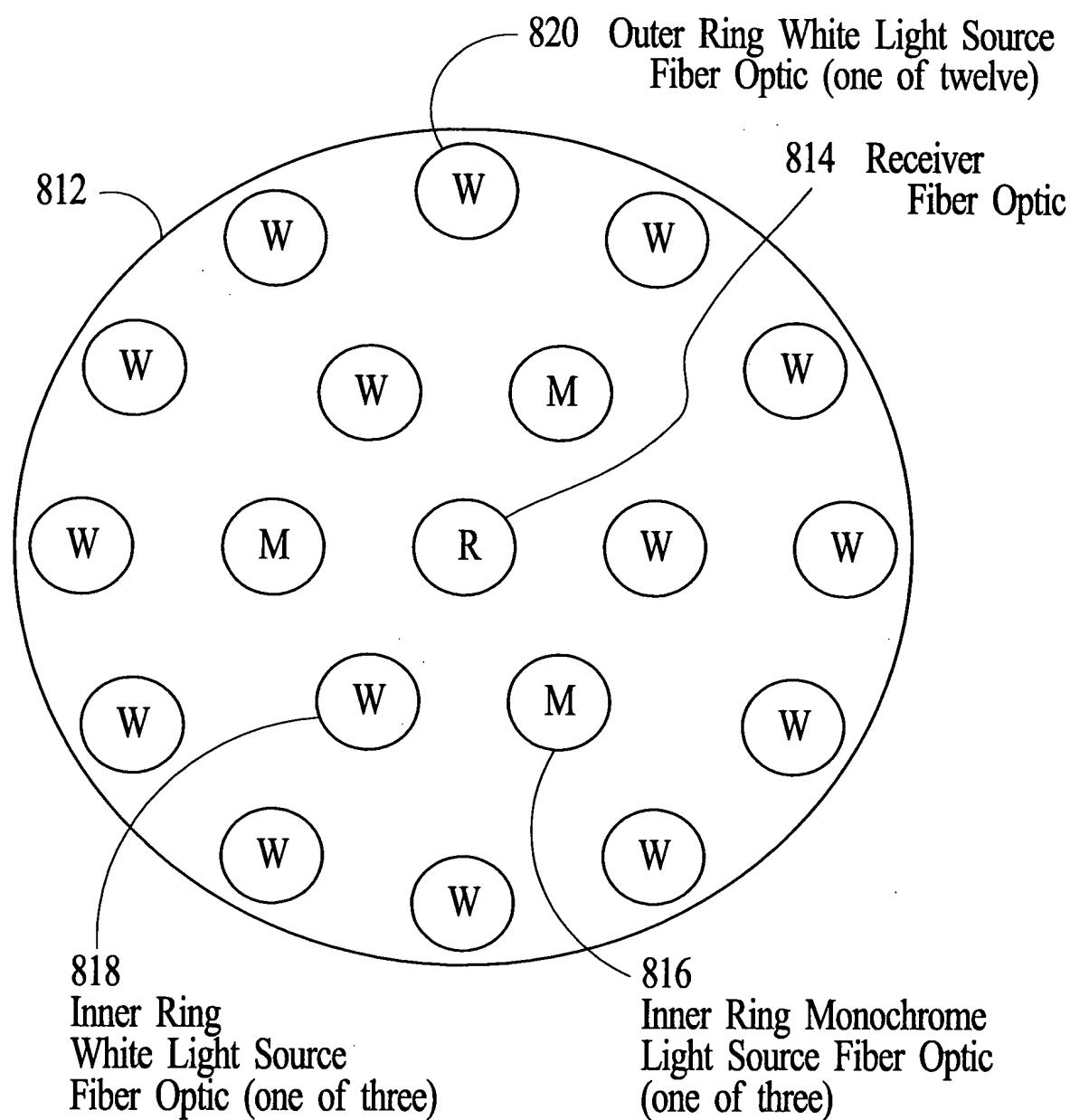


FIG. 53

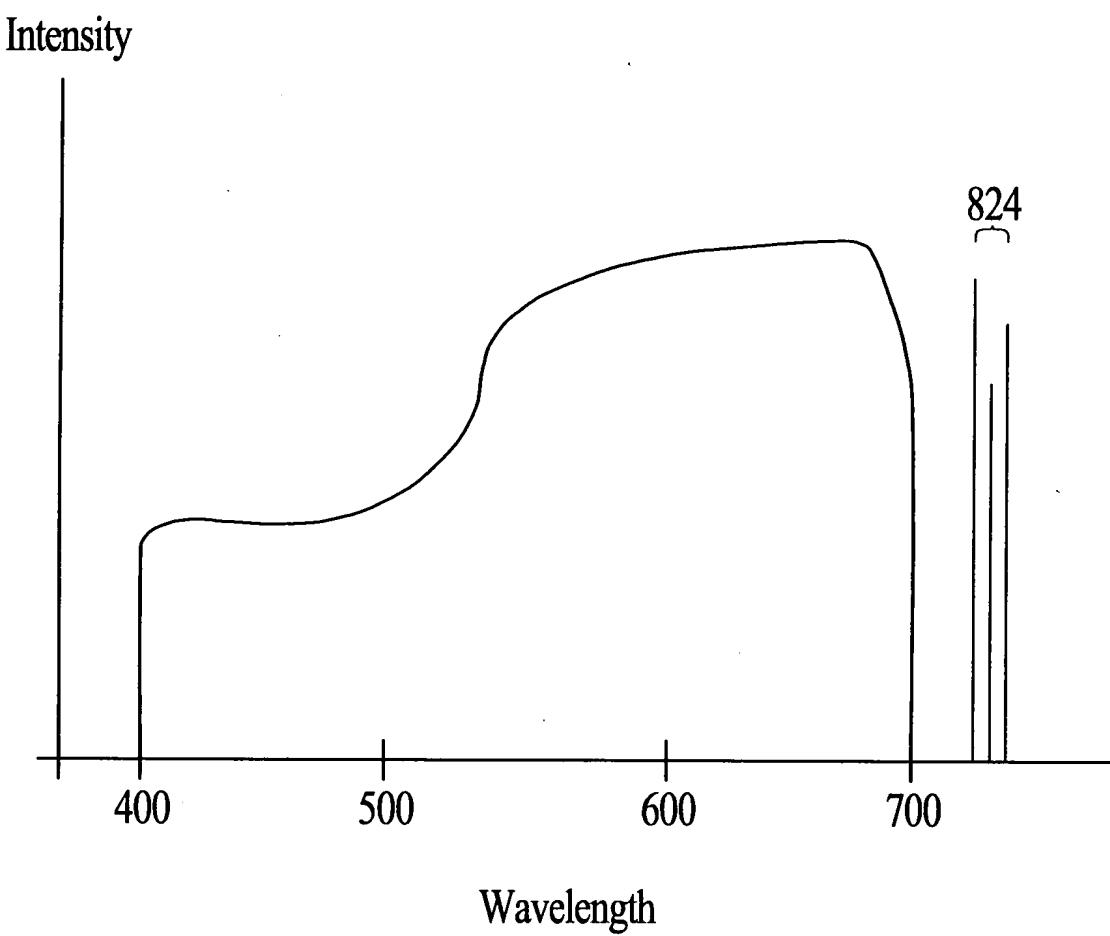


FIG. 54

Intensity

1000
800
600
400
200
0

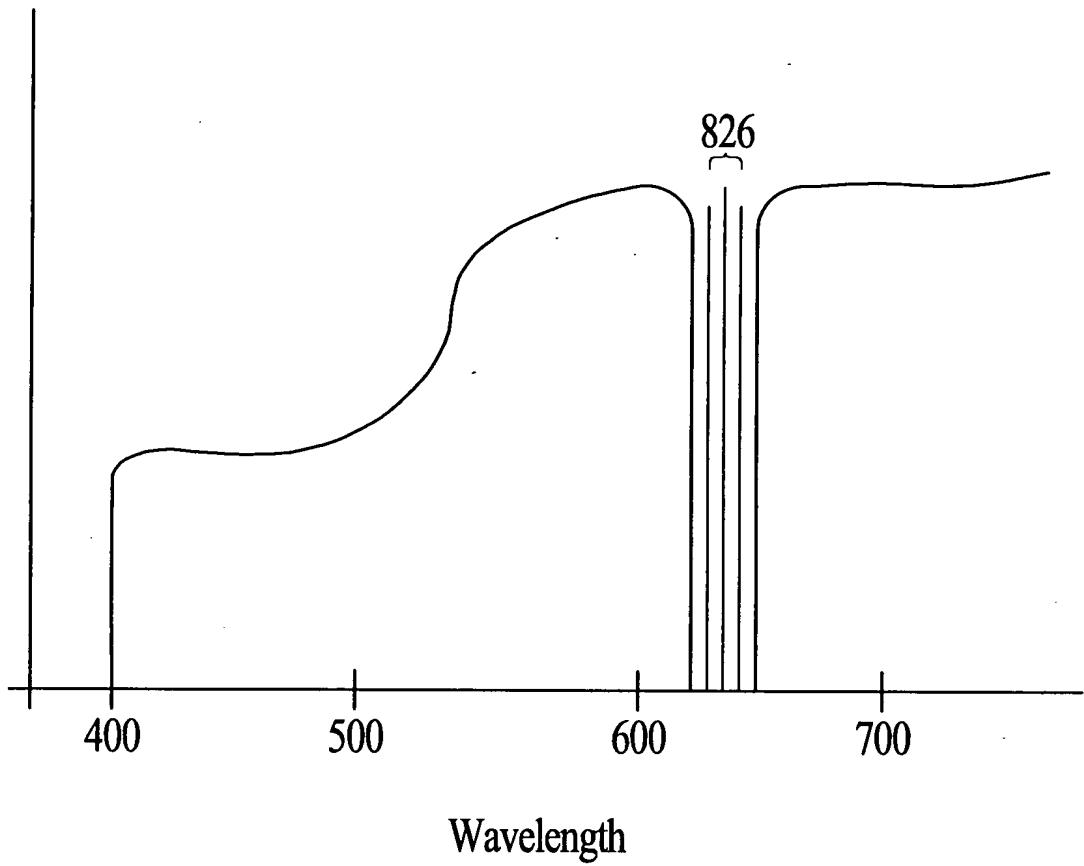
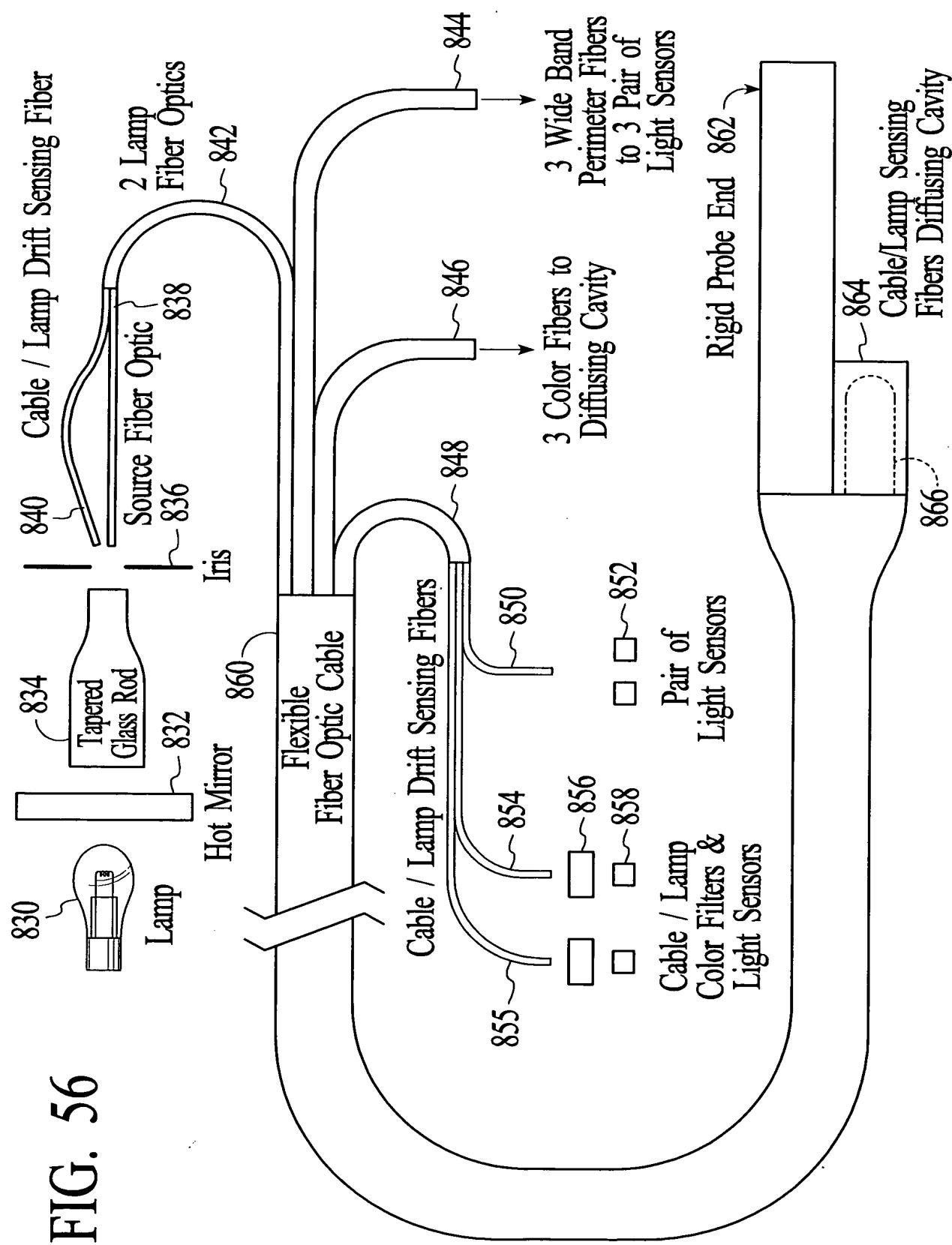


FIG. 55

FIG. 56



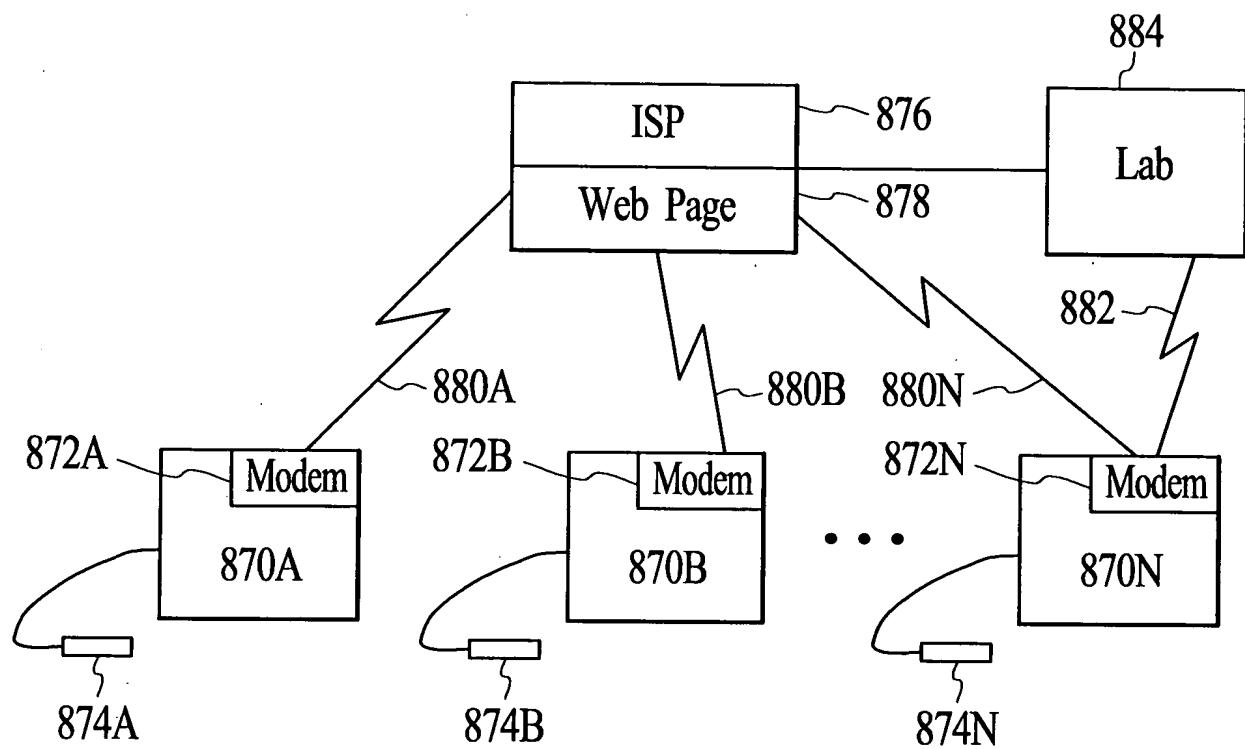


FIG. 57

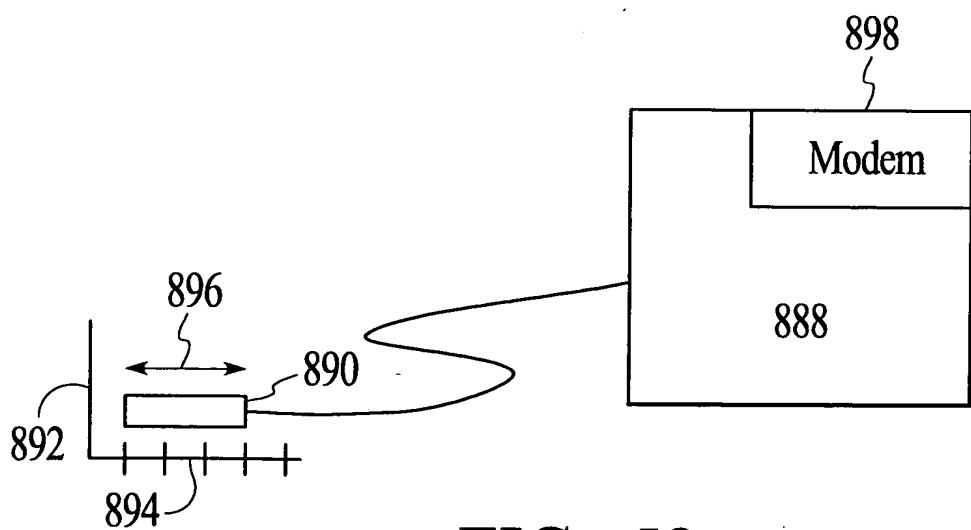


FIG. 58

20030205.04402

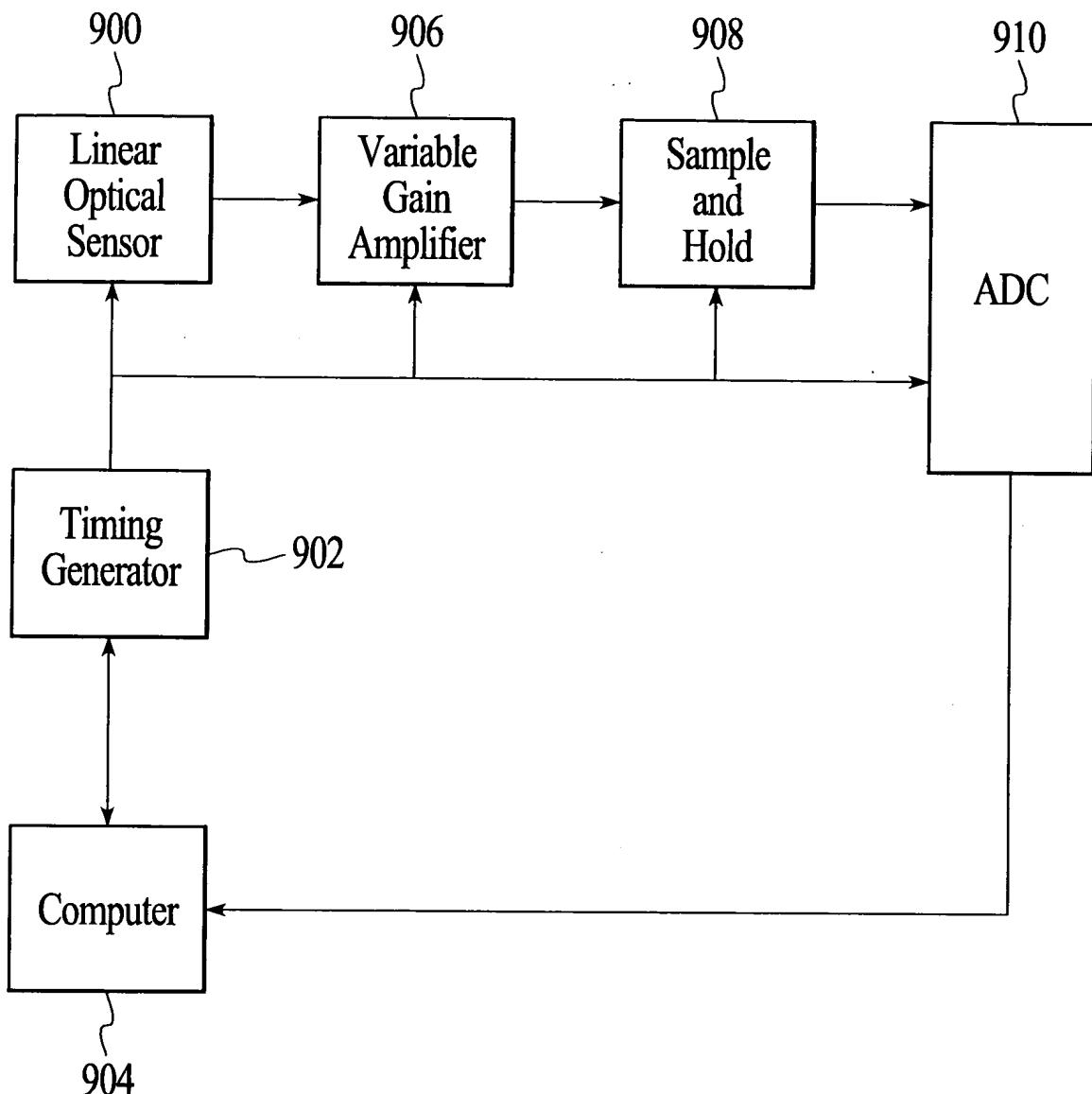


FIG. 59

10009905 - 040402

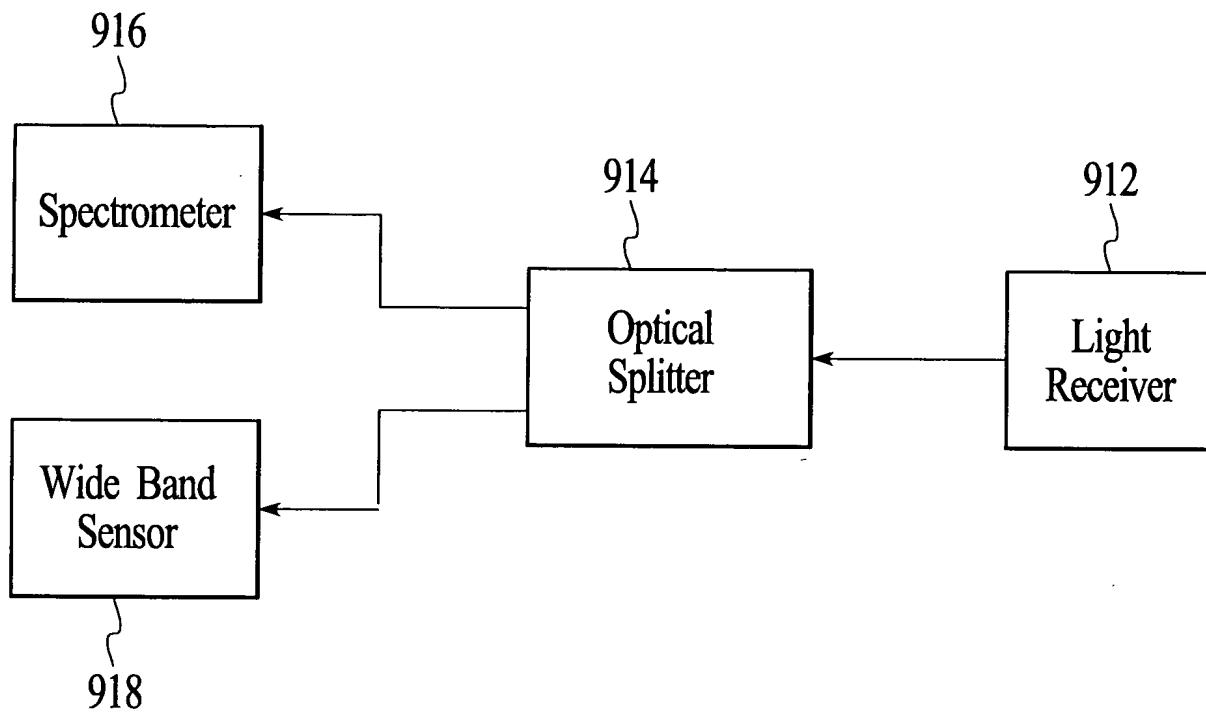


FIG. 60

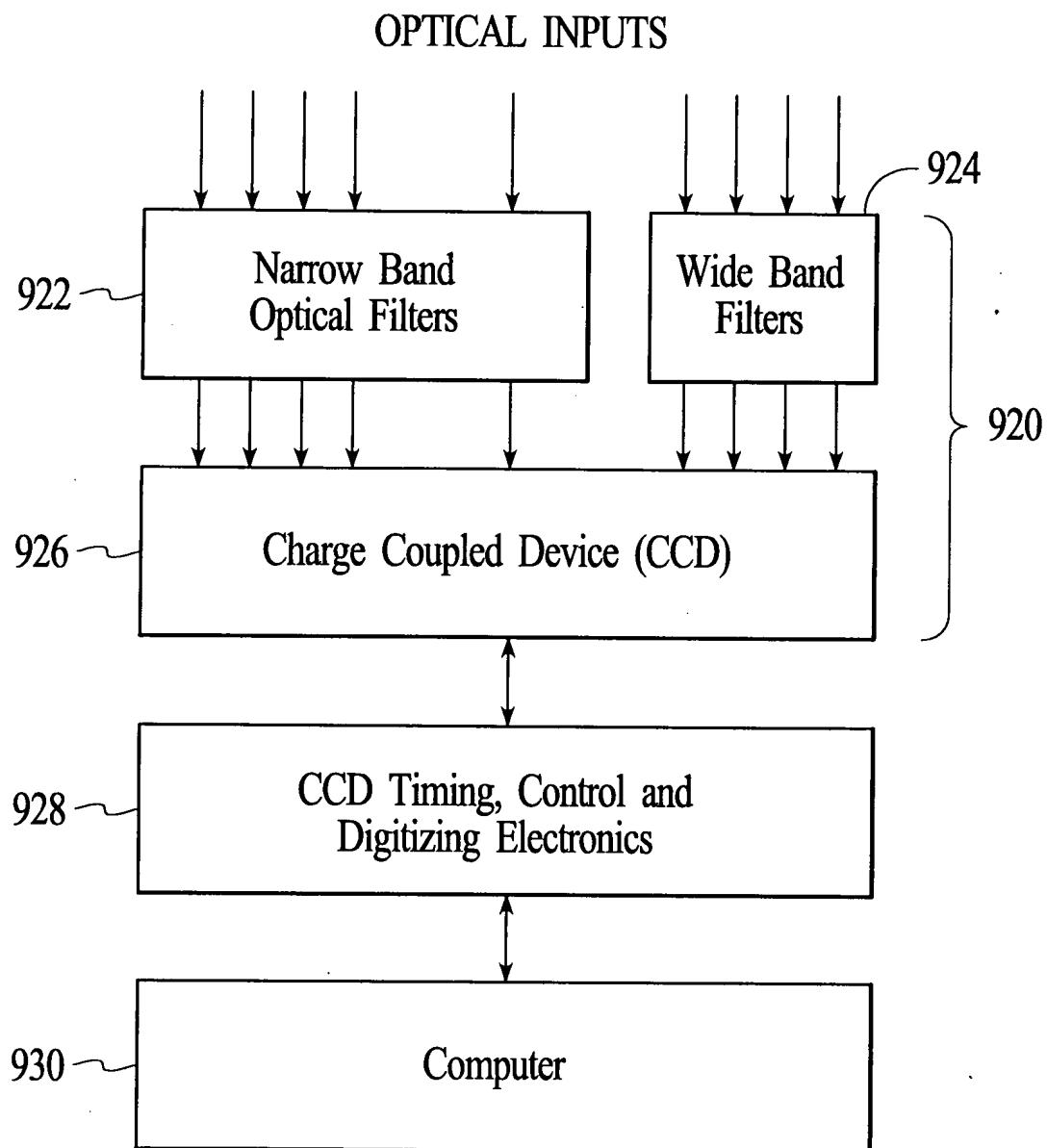


FIG. 61

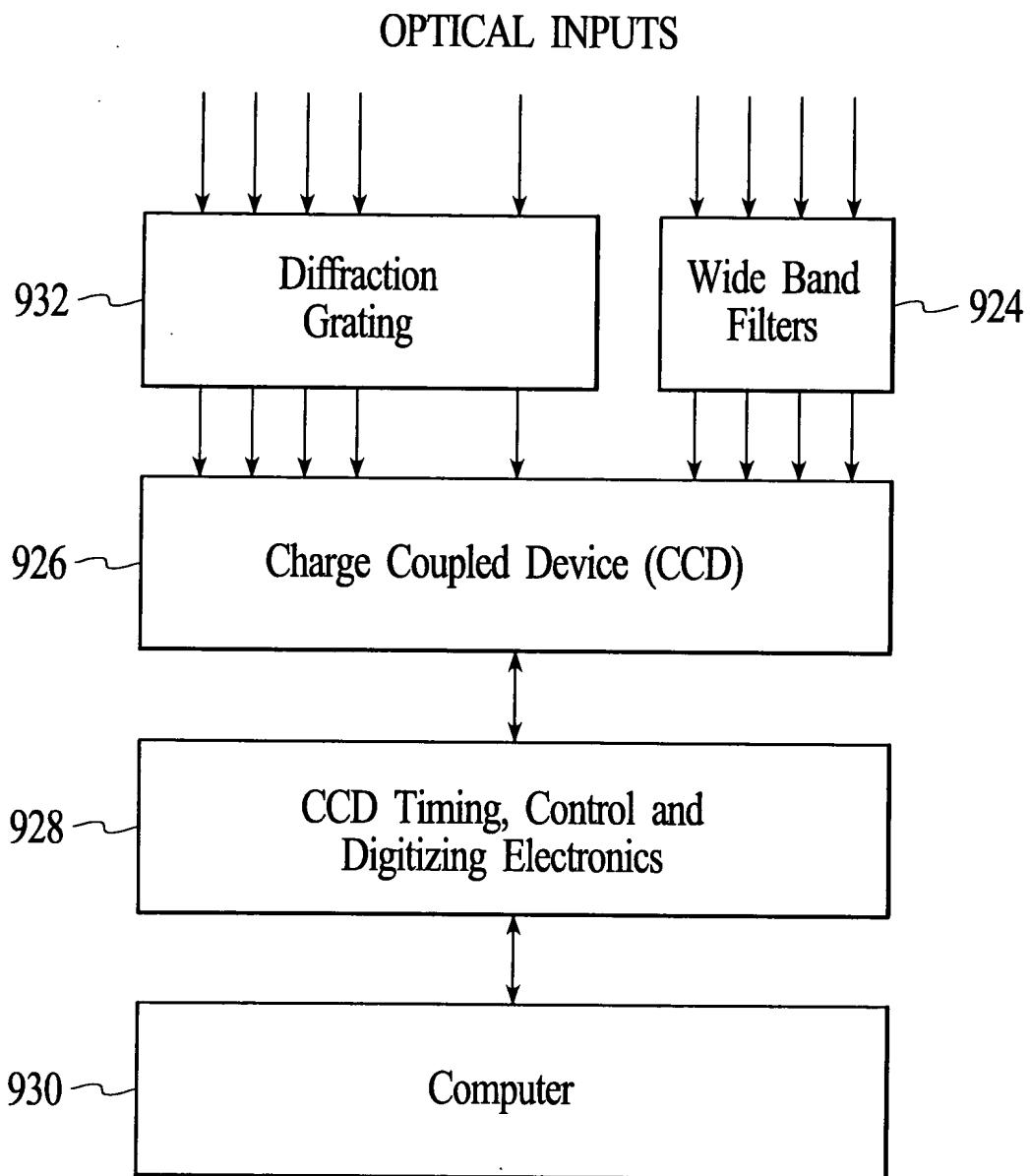


FIG. 62

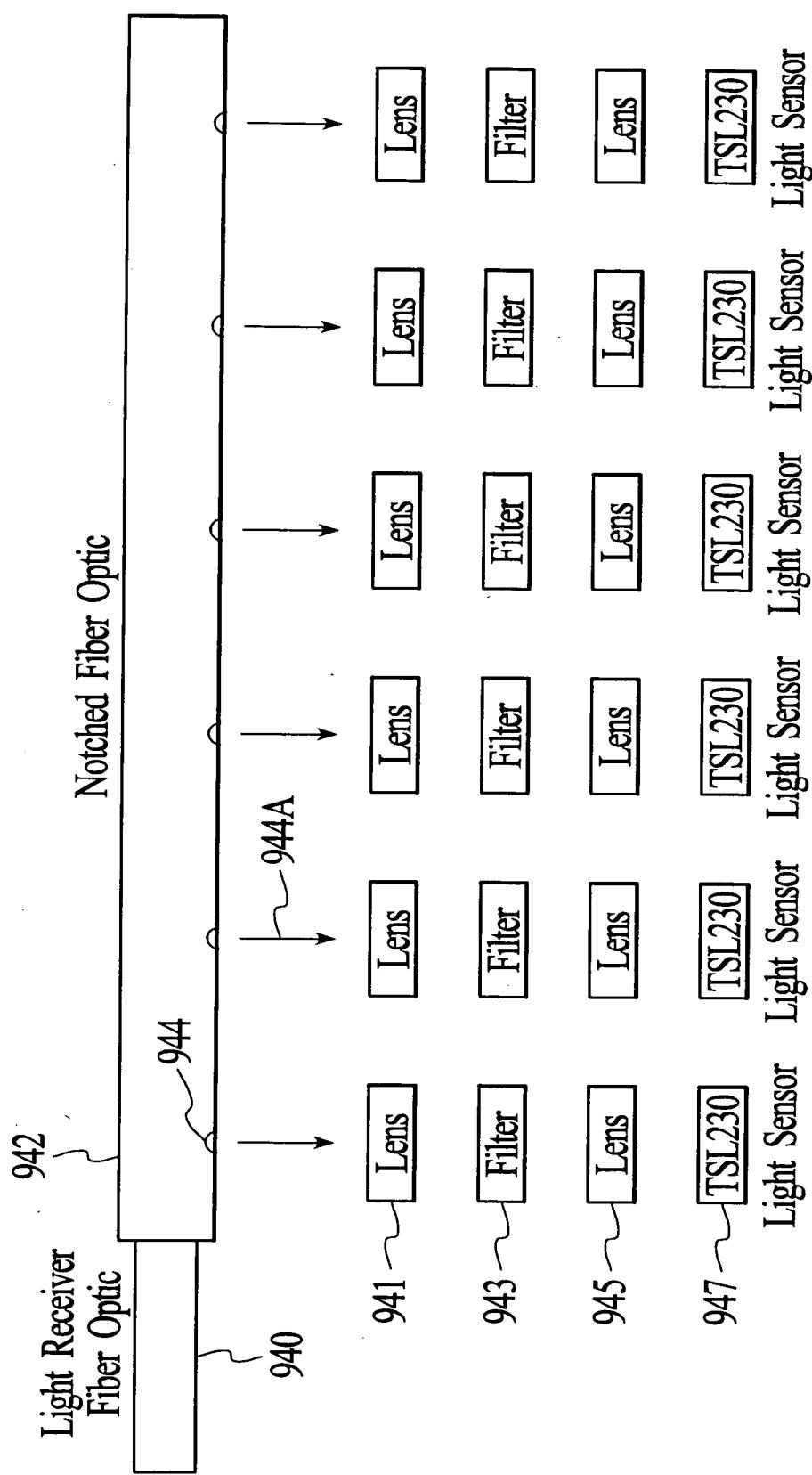


FIG. 63

FIG. 64

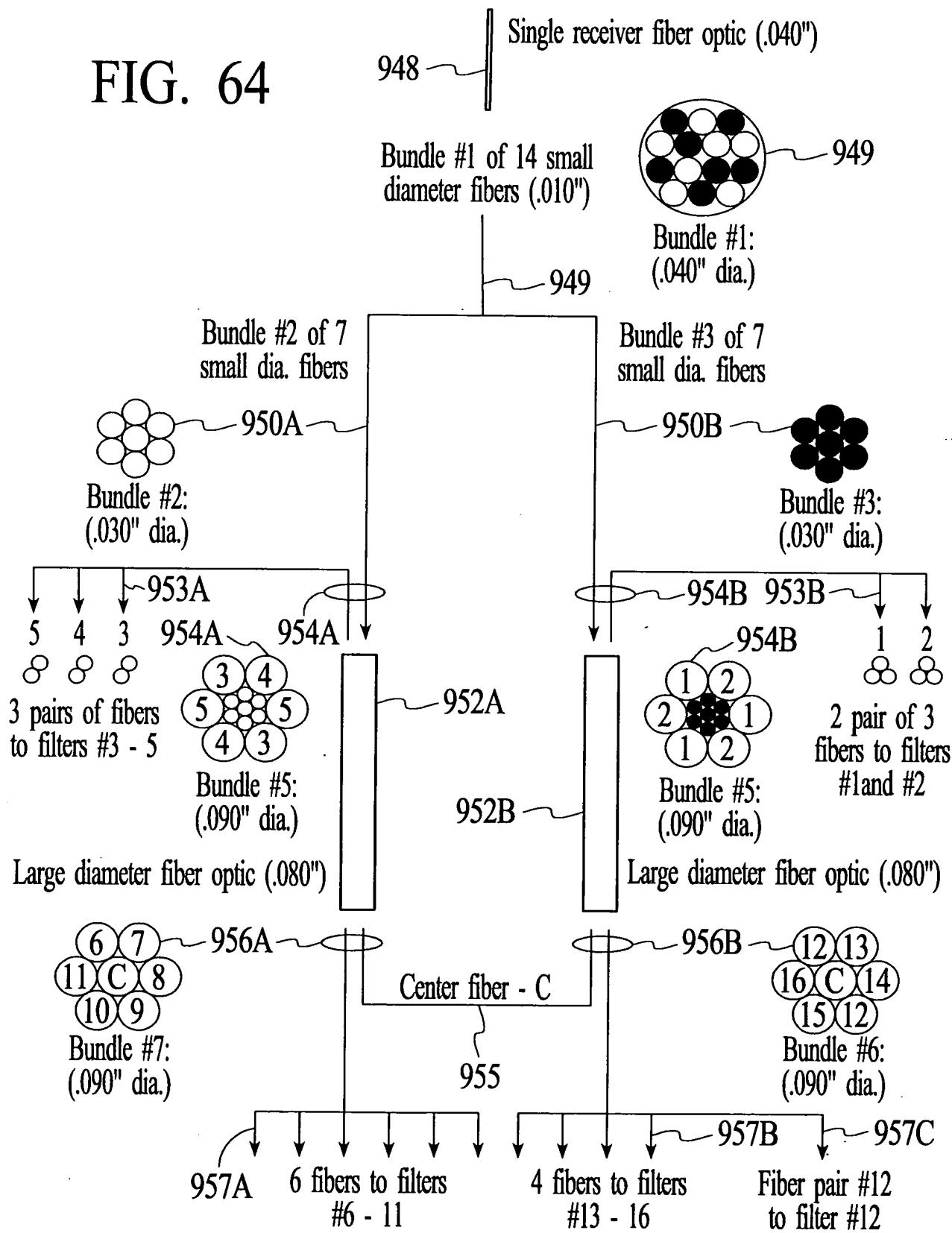
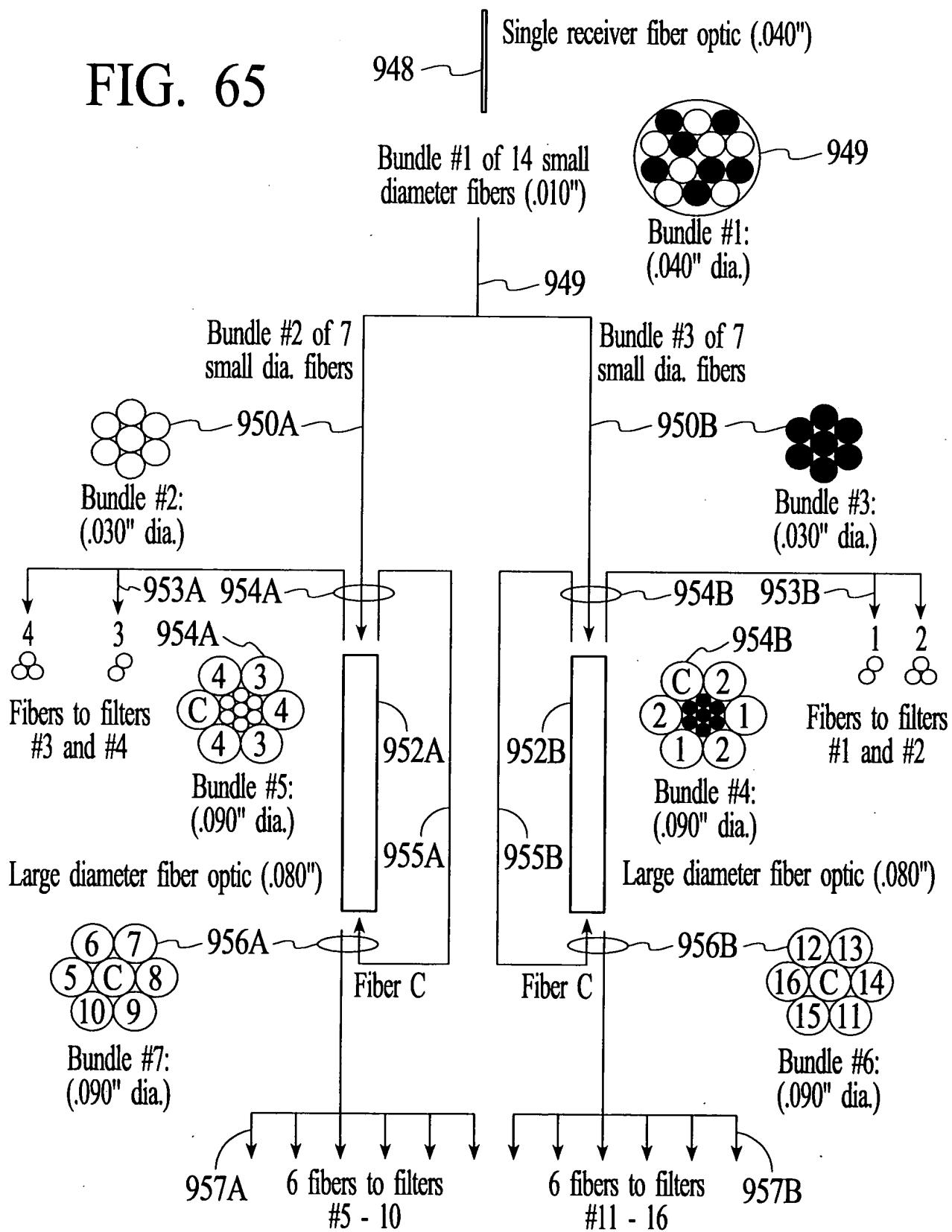


FIG. 65

100029205 - DRAFTED



10009205 - 01002

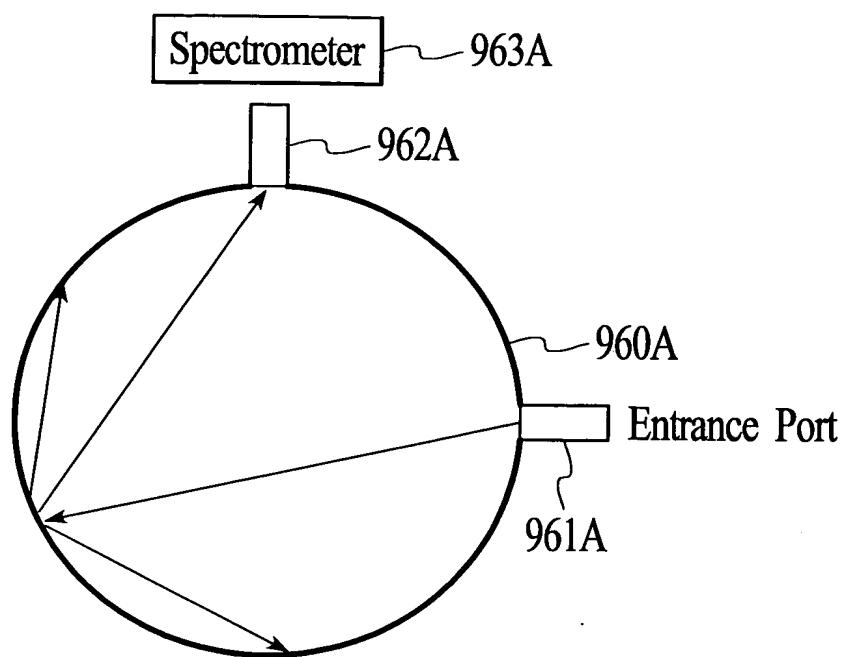


FIG. 66A

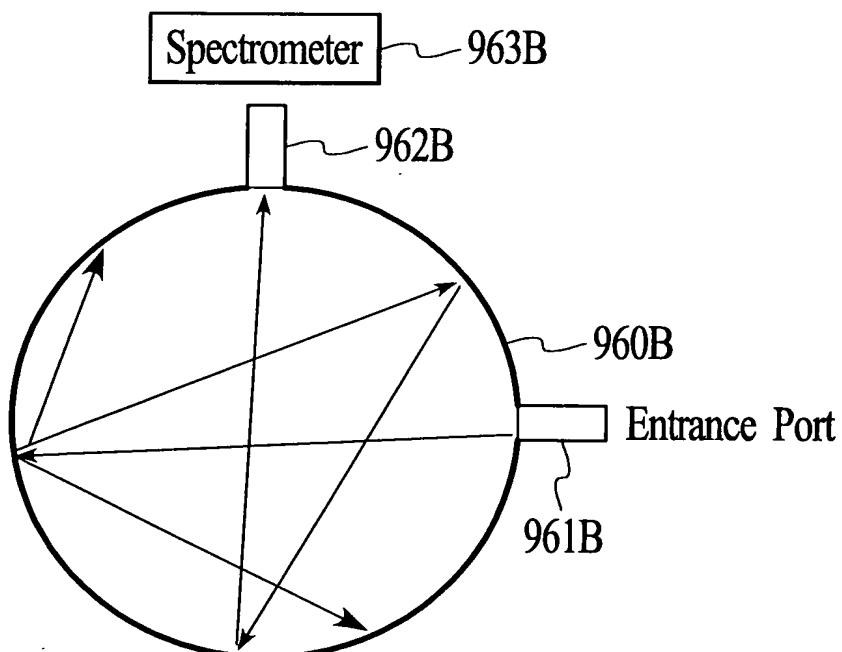


FIG. 66B

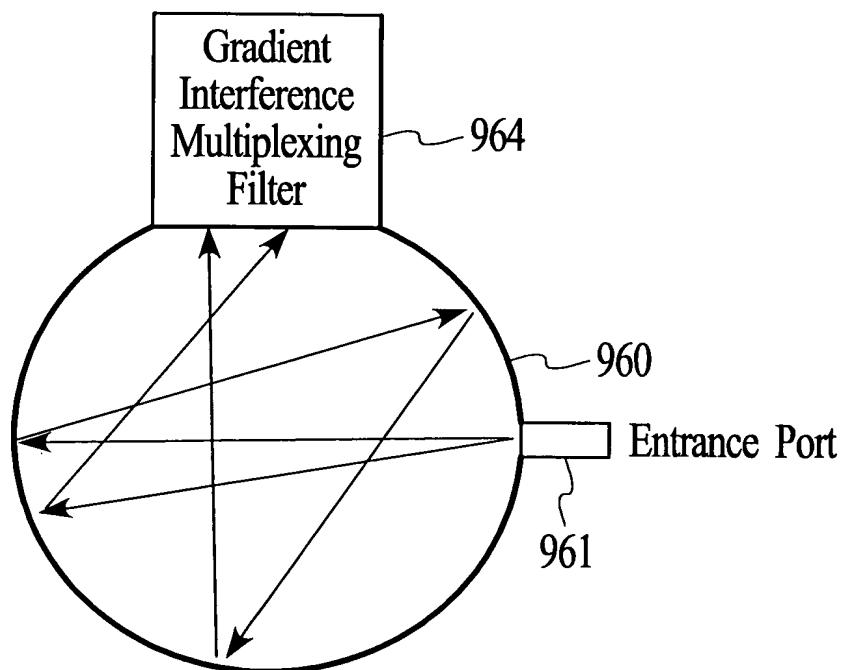


FIG. 67A

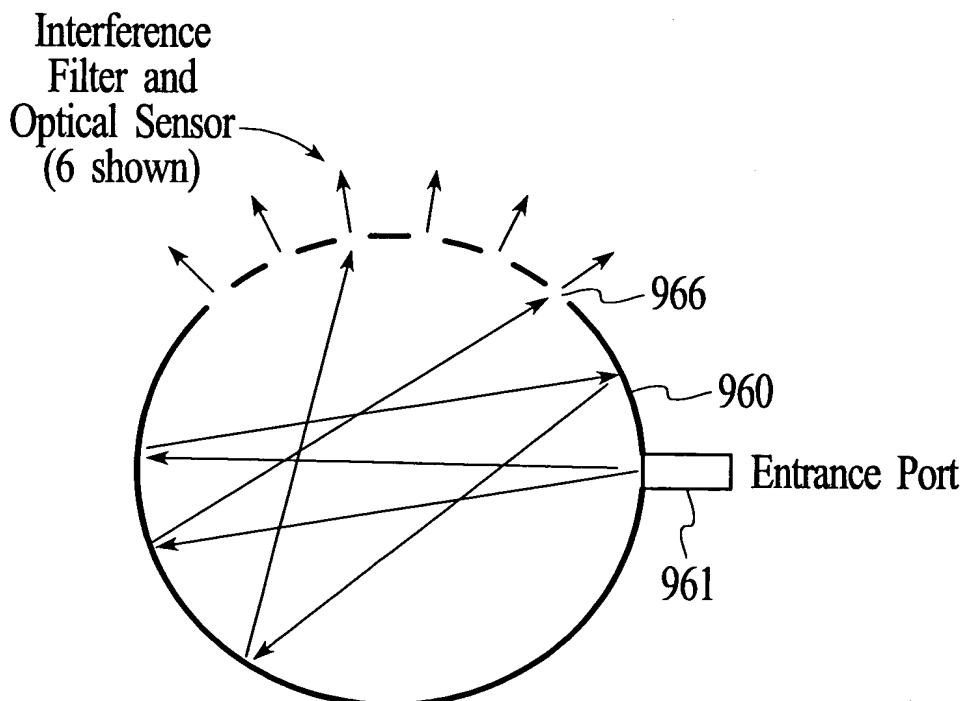


FIG. 67B

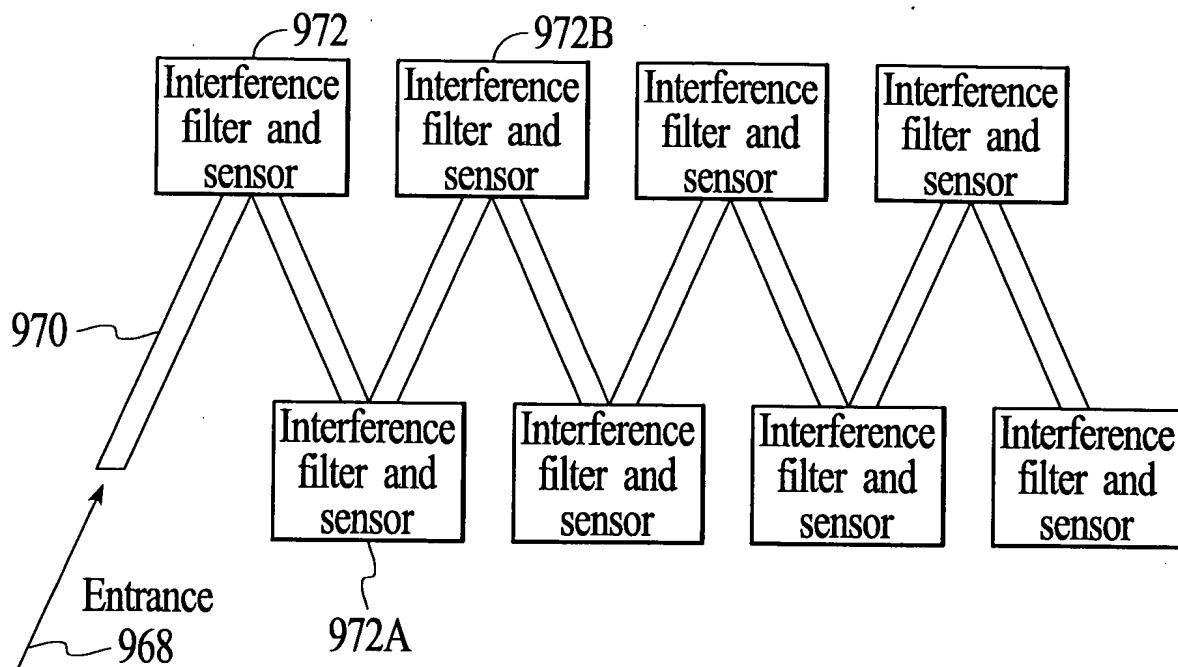


FIG. 68

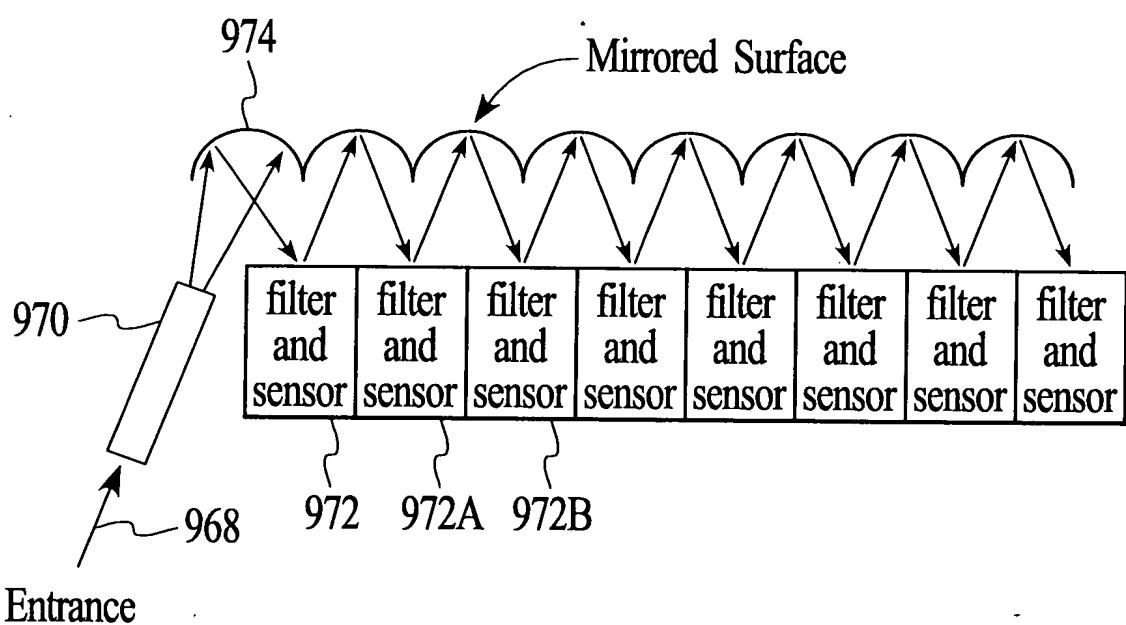


FIG. 69

10039205 - 010402

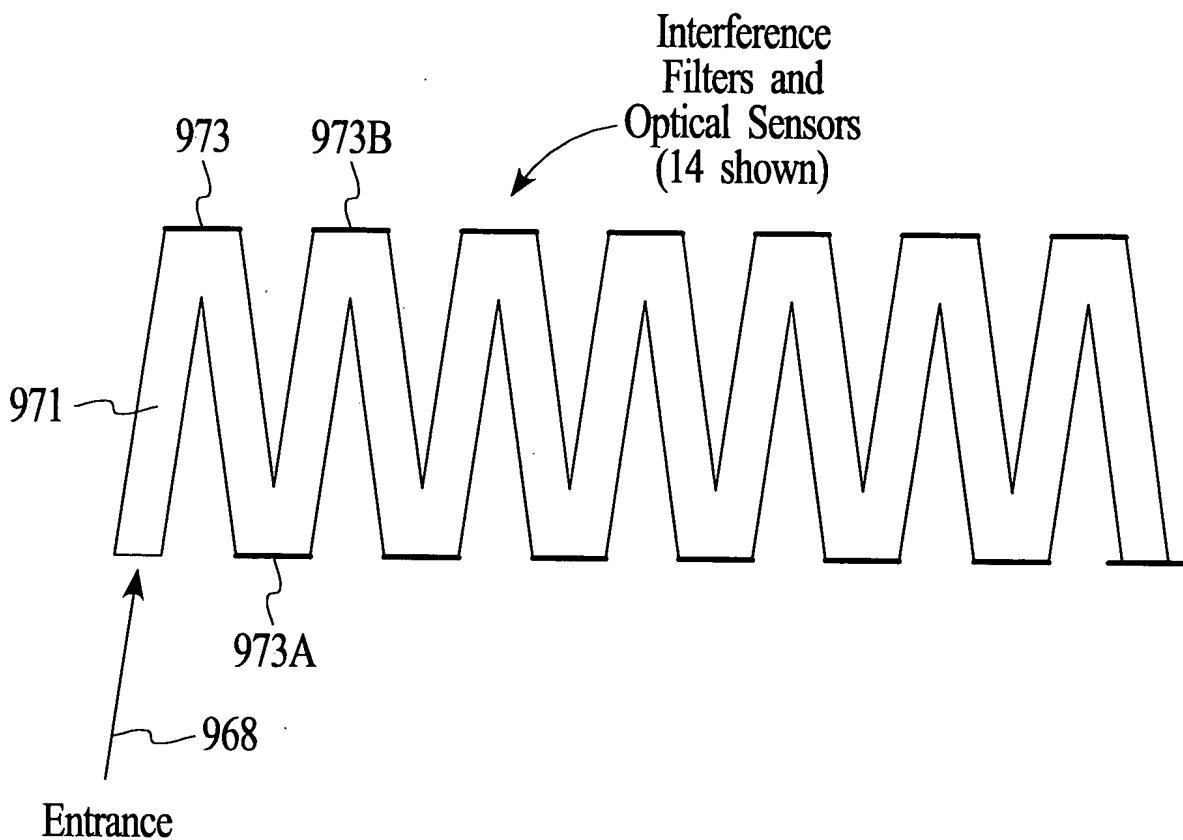
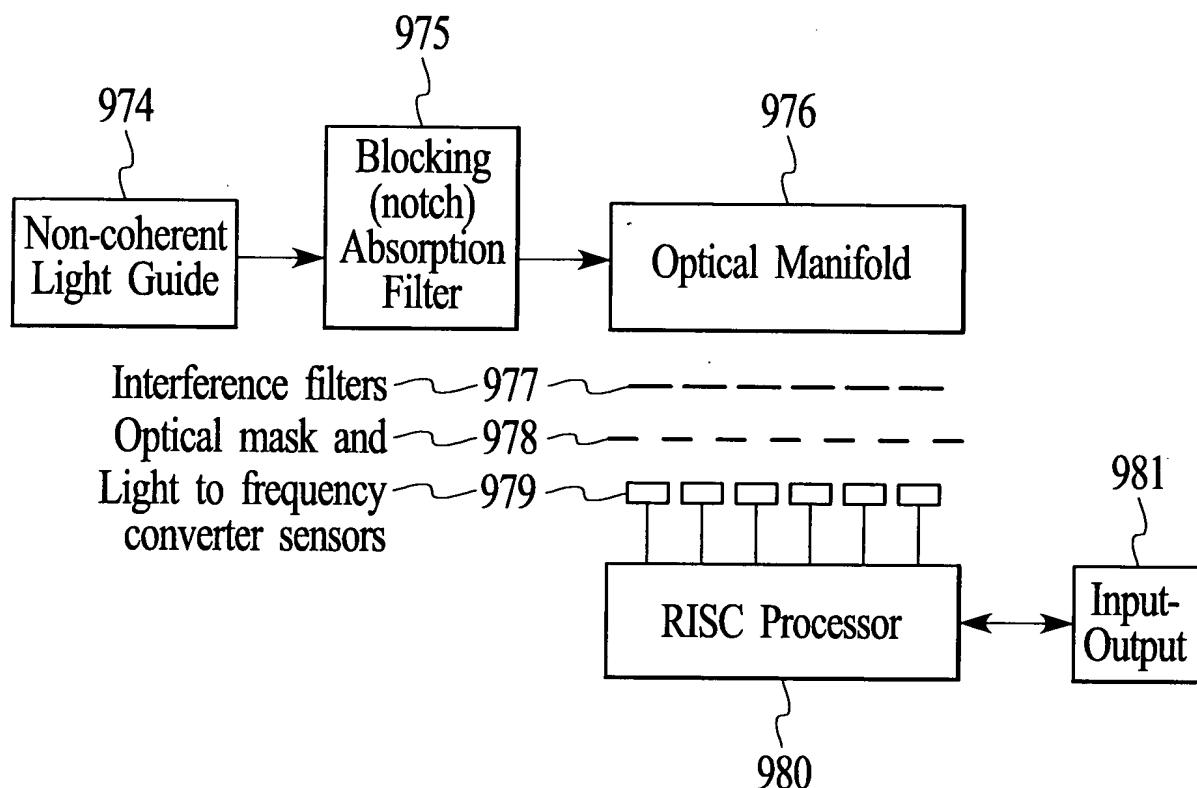


FIG. 70

10020205 · 010402

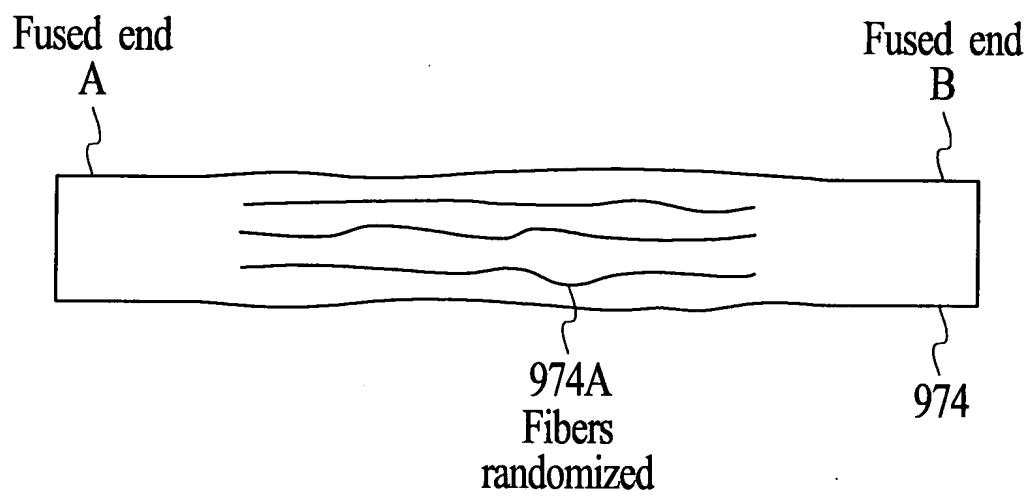


Block Diagram

FIG. 71

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10039205 "DRAFT"



Non-Coherent Light Guide

FIG. 72

10039205 - 01.04.02

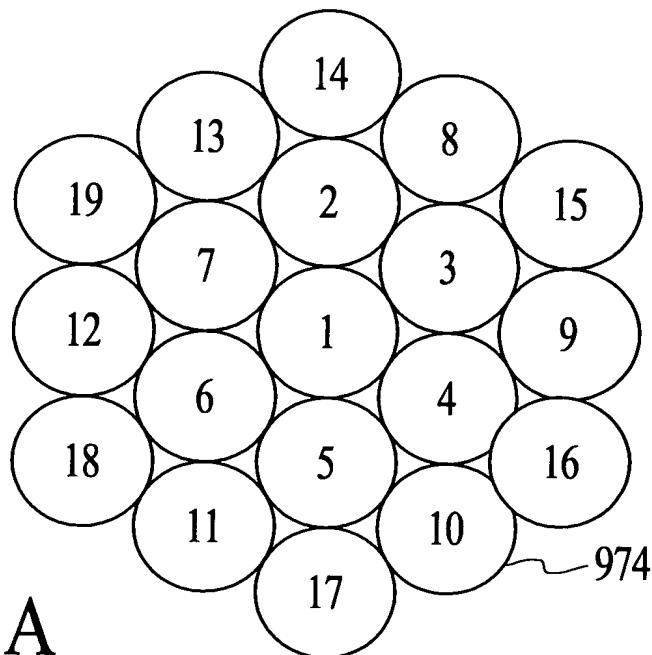


FIG. 73A

Non-Coherent Light Guide End View A

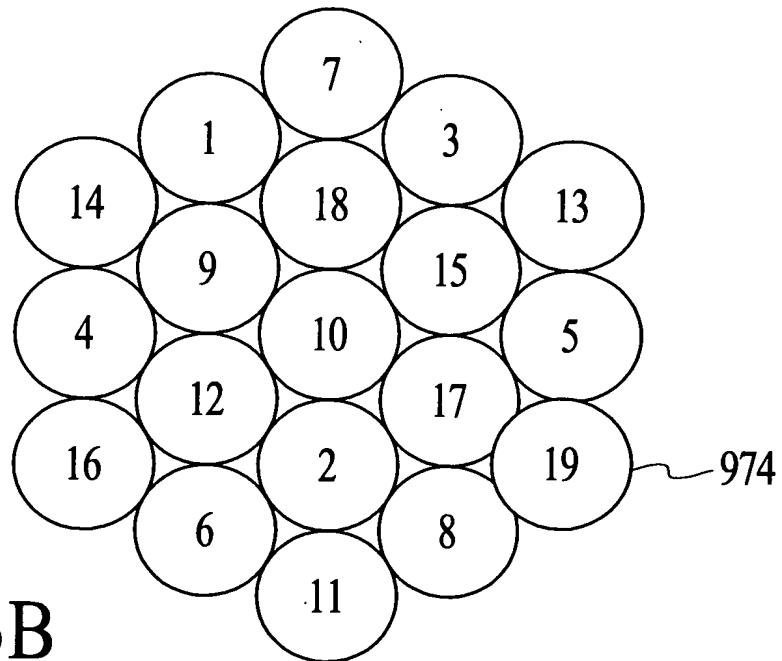
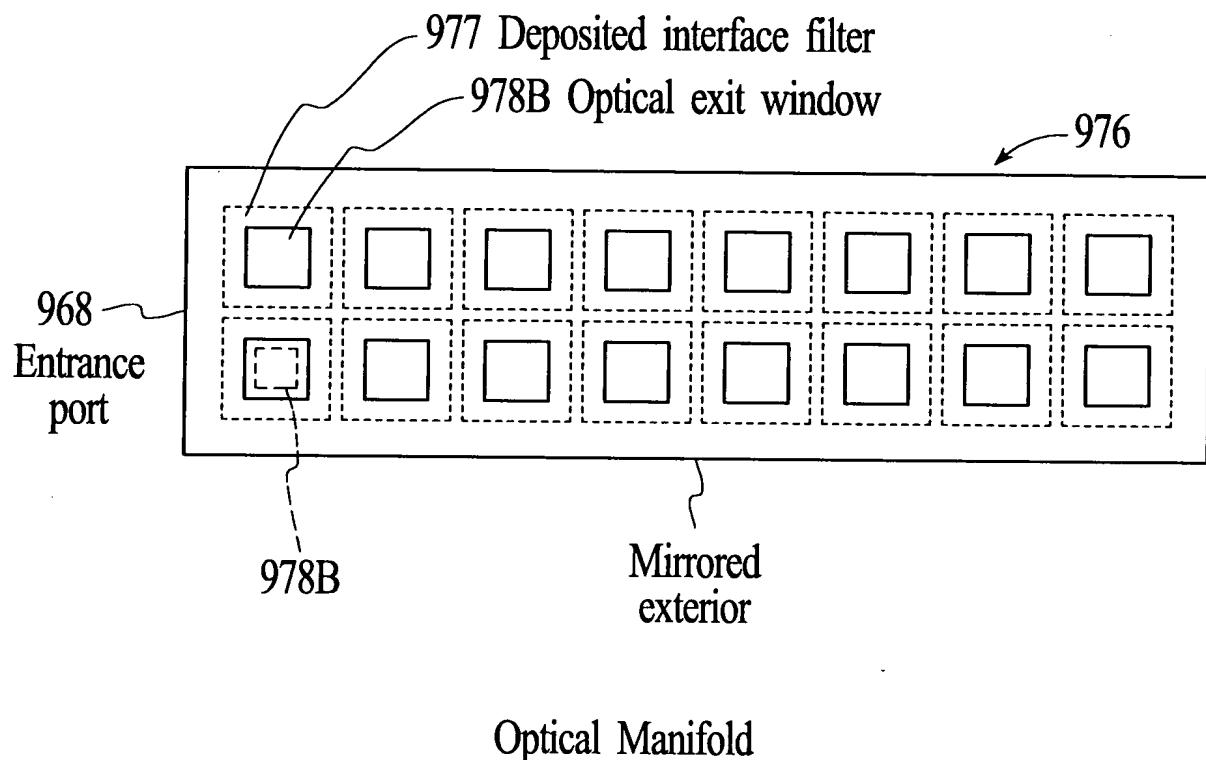


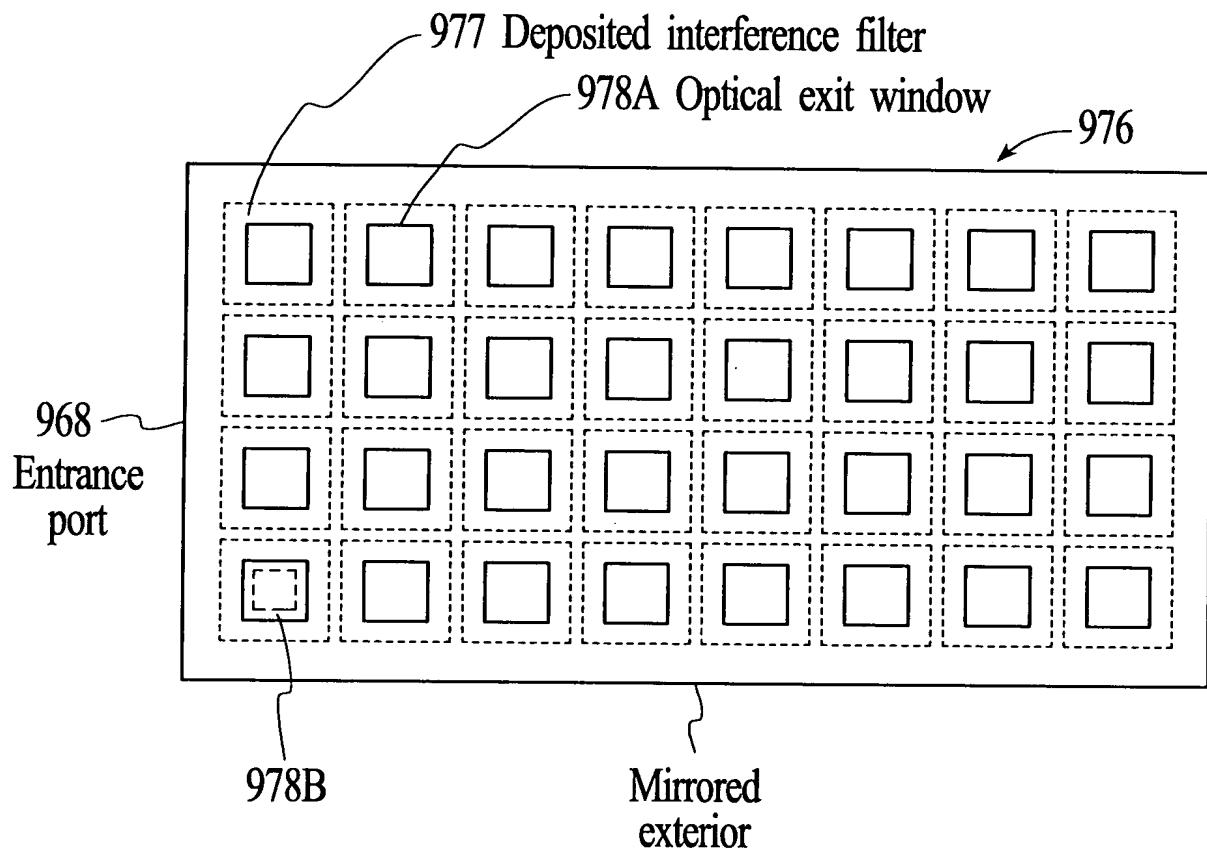
FIG. 73B

Non-Coherent Light Guide End View B



Optical Manifold

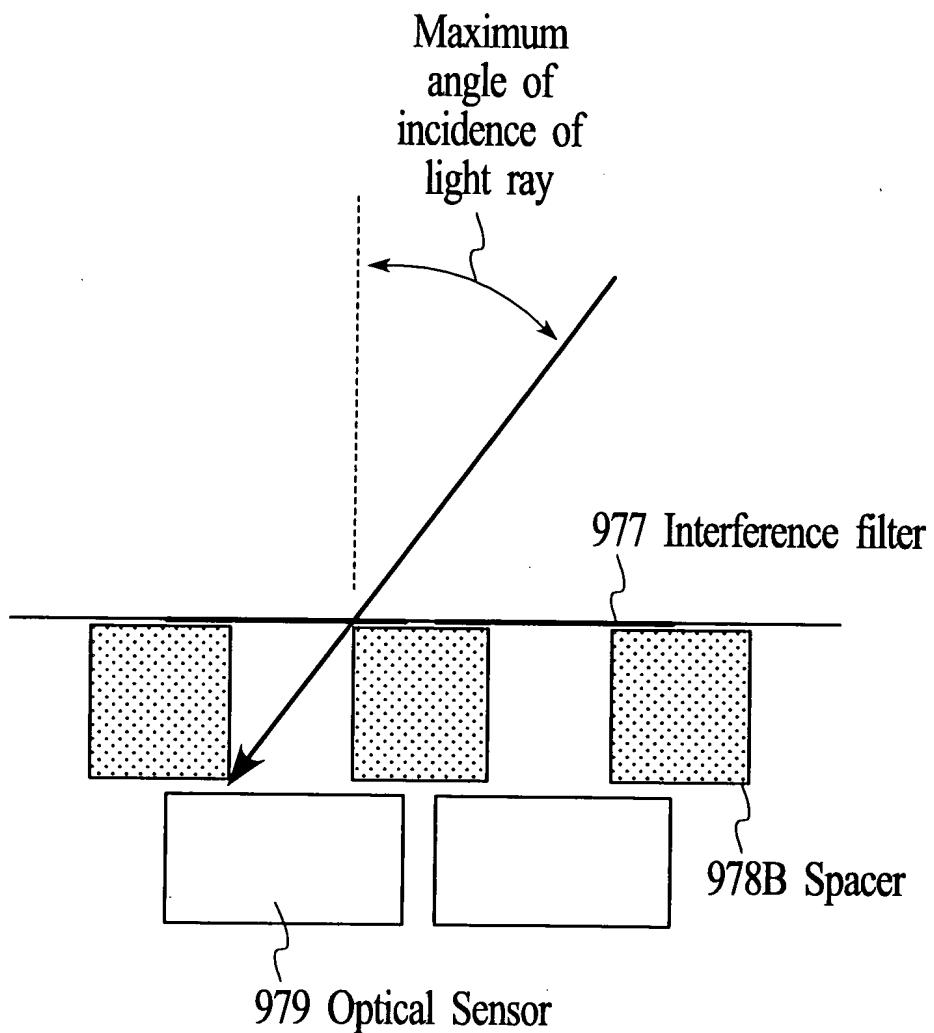
FIG. 74A



Optical Manifold A Exit Port Detail

FIG. 74B

40039205.03.0402



Optical Manifold Spacer

FIG. 75

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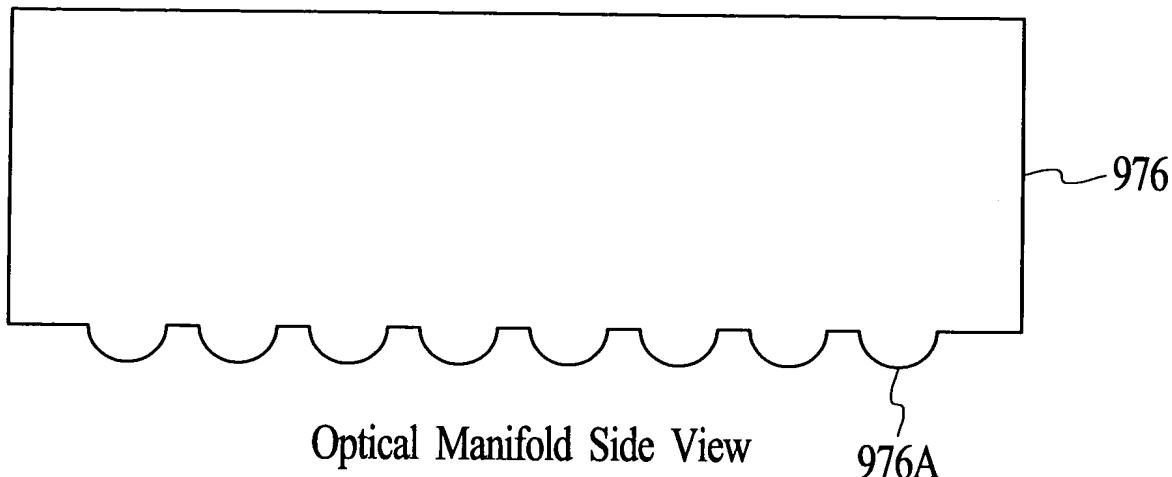
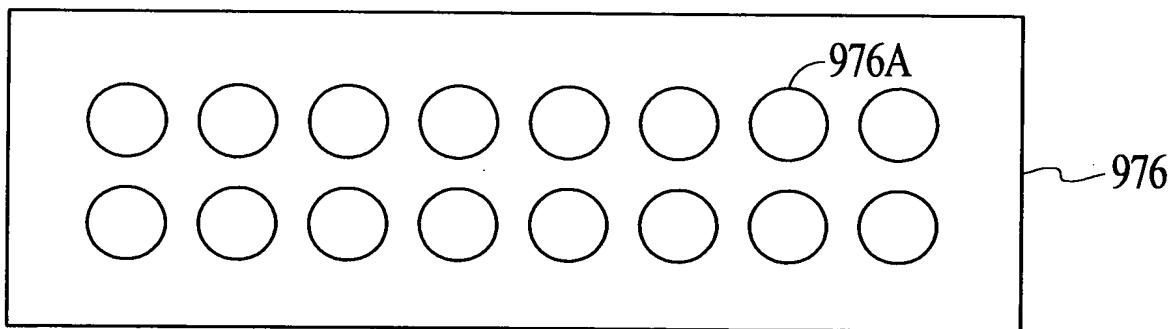


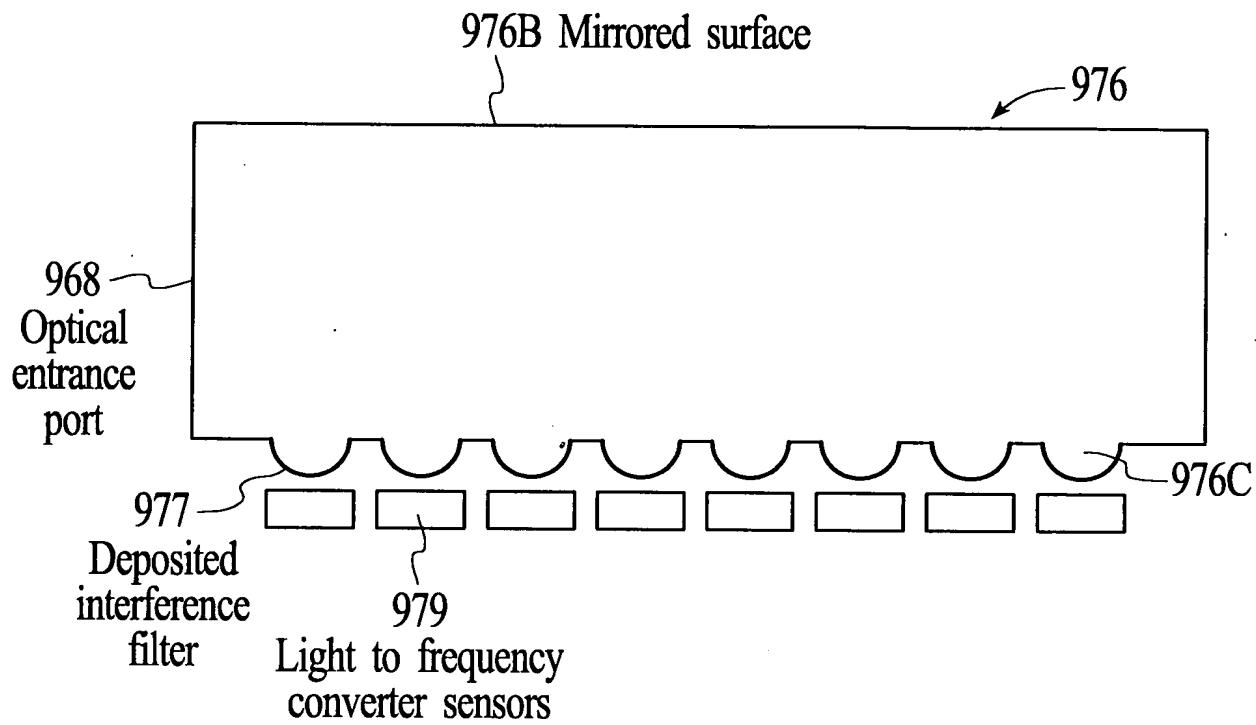
FIG. 76A

10039205.03.04.CE



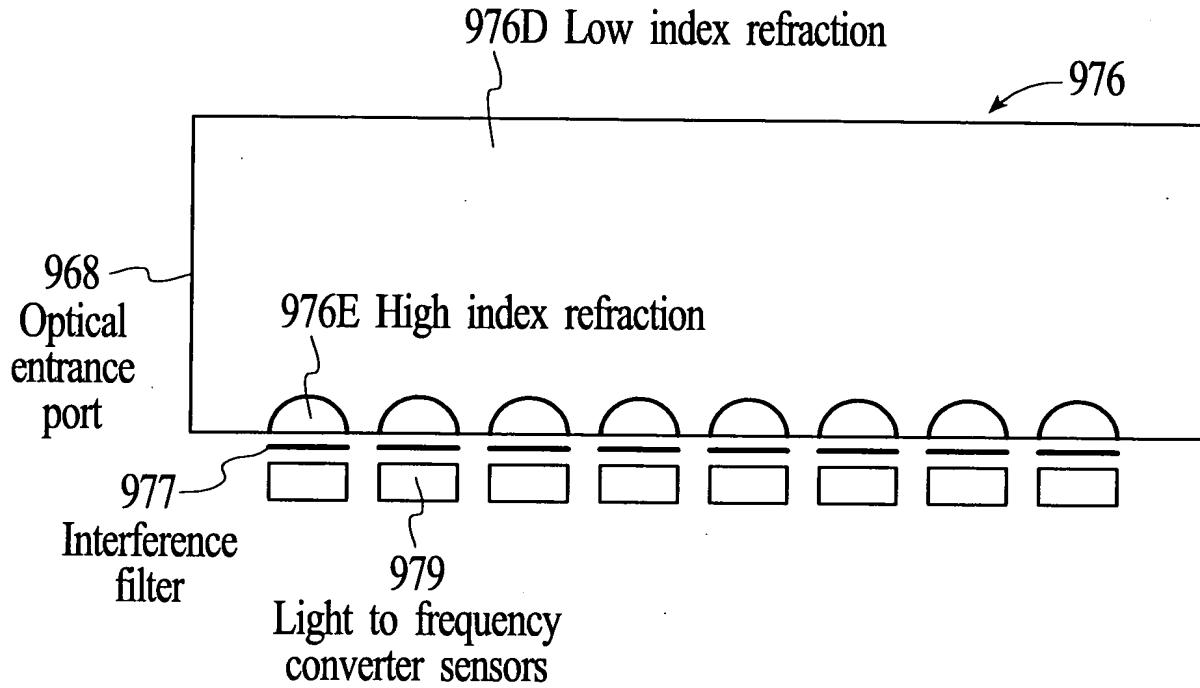
Optical Manifold Bottom View

FIG. 76B



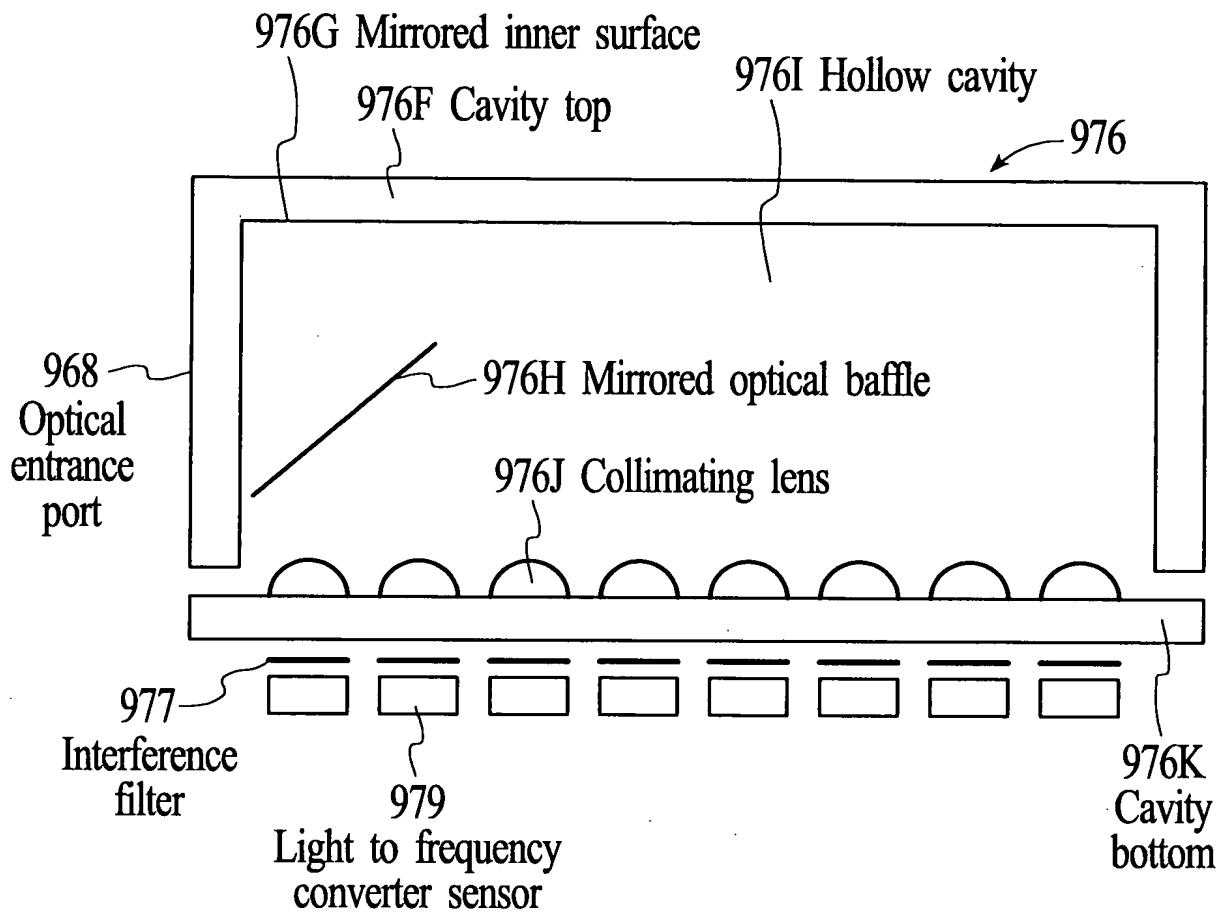
Optical Manifold with Collimation Lenses

FIG. 77



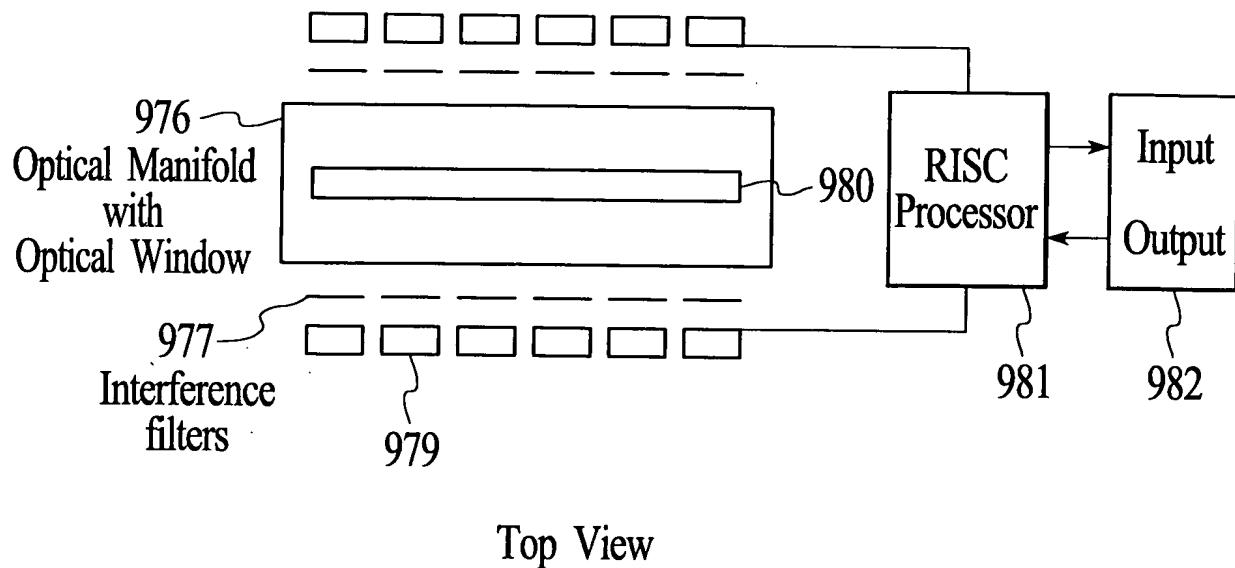
Optical Manifold with Collimation Lenses Constructed from Two Optical Materials with Different Indexes of Refraction

FIG. 78



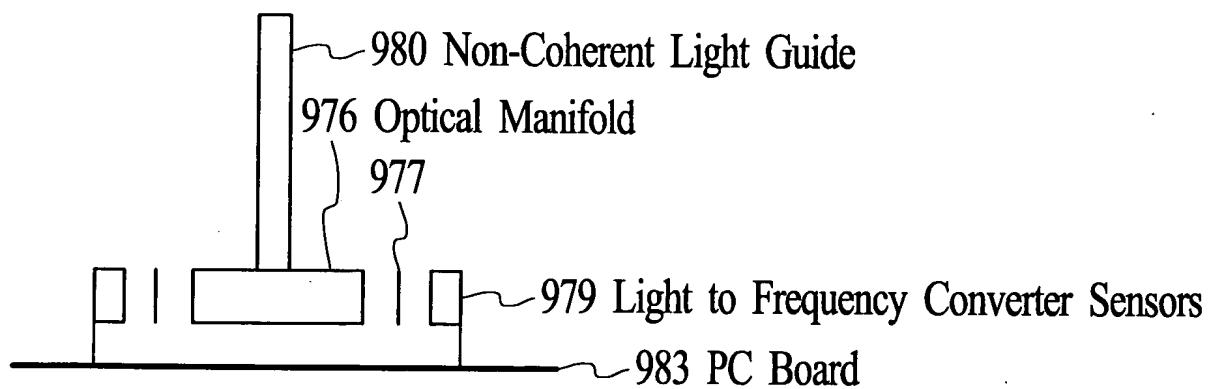
Optical Manifold with Collimating
Lenses and Hollow Cavity and Baffle

FIG. 79



Top View

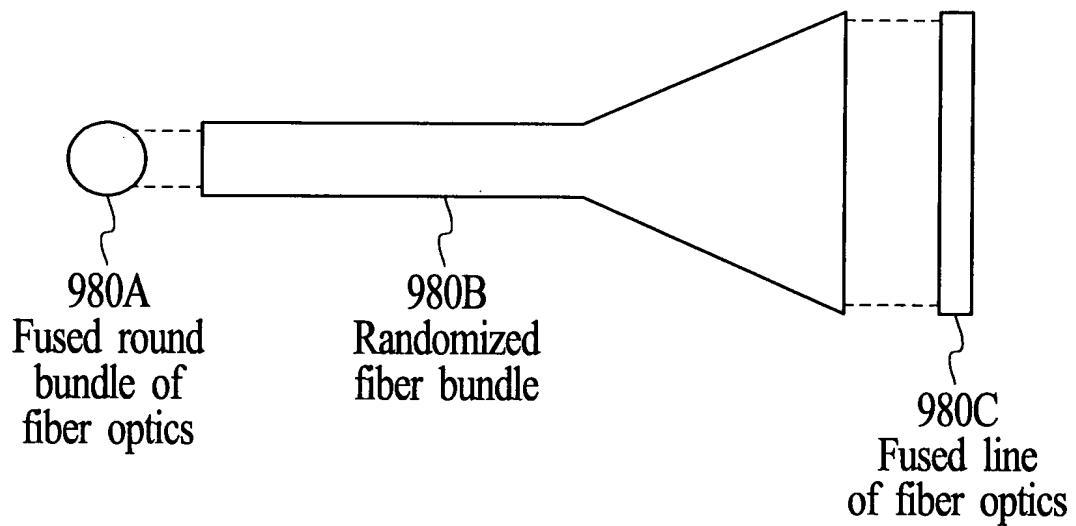
FIG. 80A



Side View

FIG. 80B

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Round to Line Non-Coherent Light Guide

FIG. 81

Round to Line Non-Coherent Light Guide

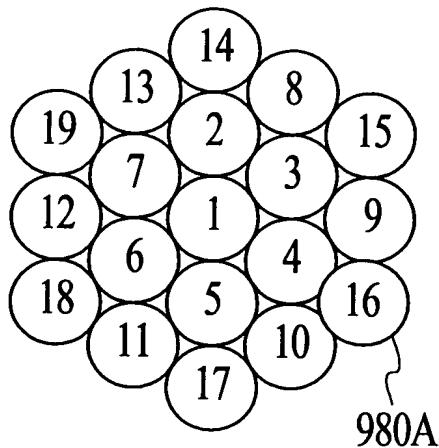


FIG. 82A

Non-Coherent Light Guide Round End

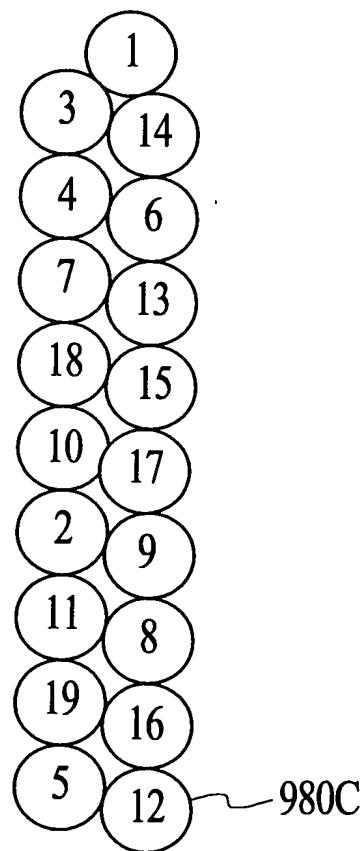
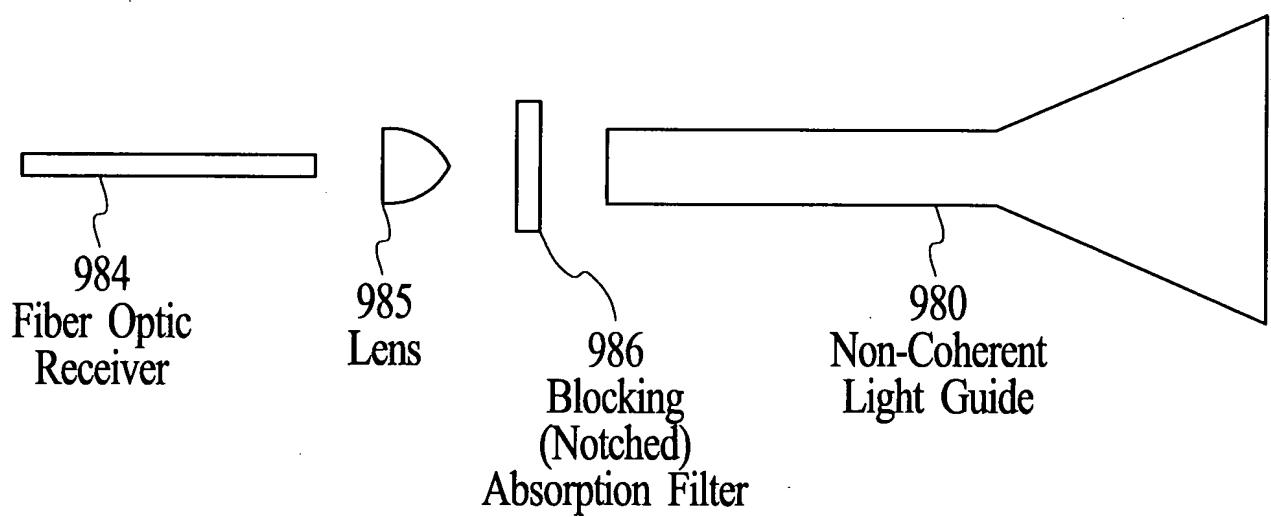


FIG. 82B

Non-Coherent Light Guide Line End

16039205.010402



Round to Line Non-Coherent Light Guide
with Lens and Absorption Filters

FIG. 83

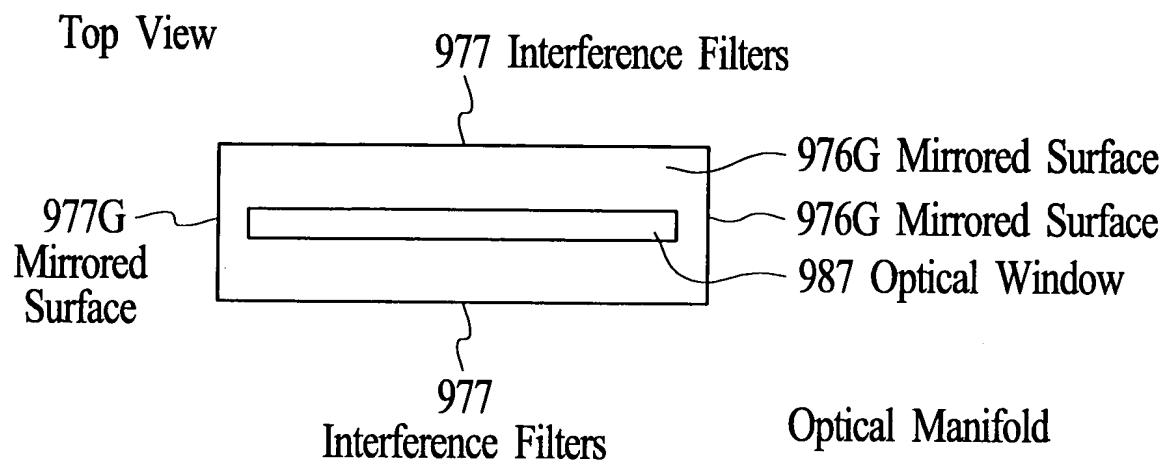


FIG. 84A

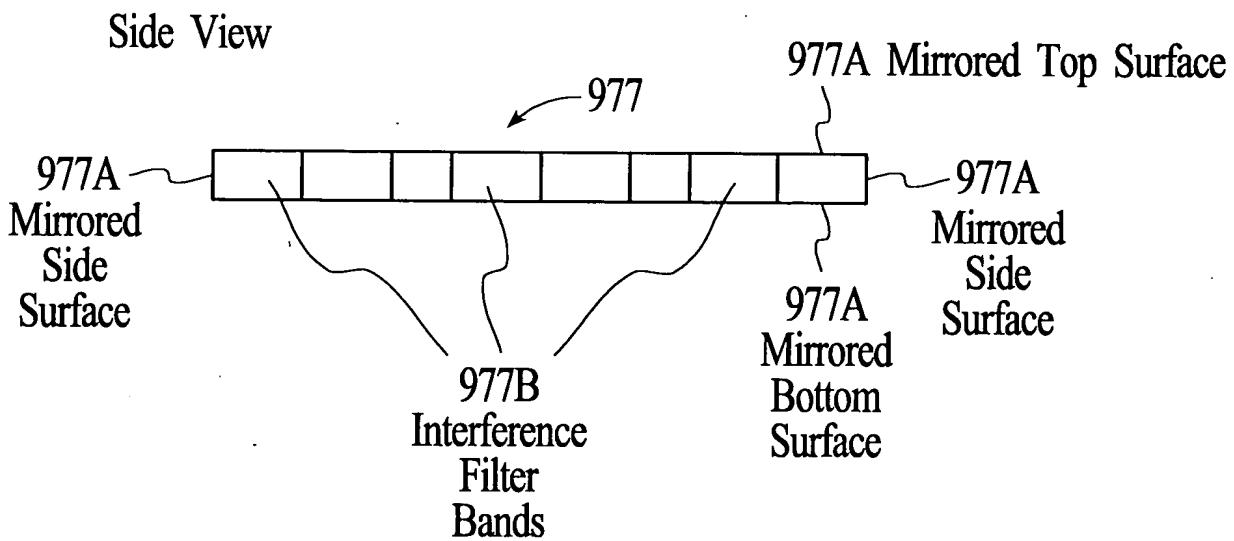


FIG. 84B

Top View

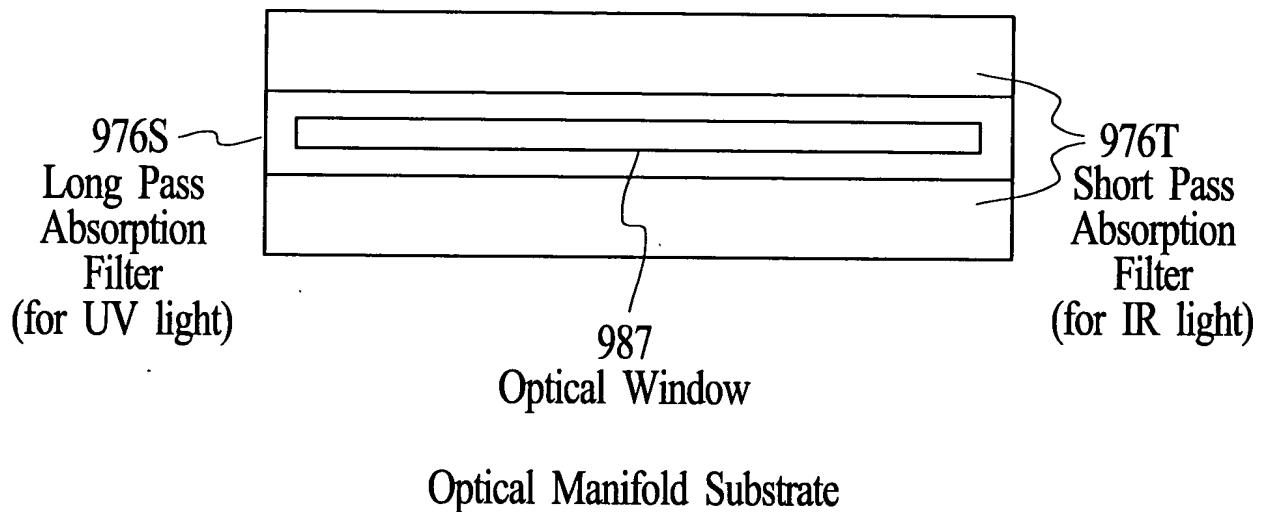
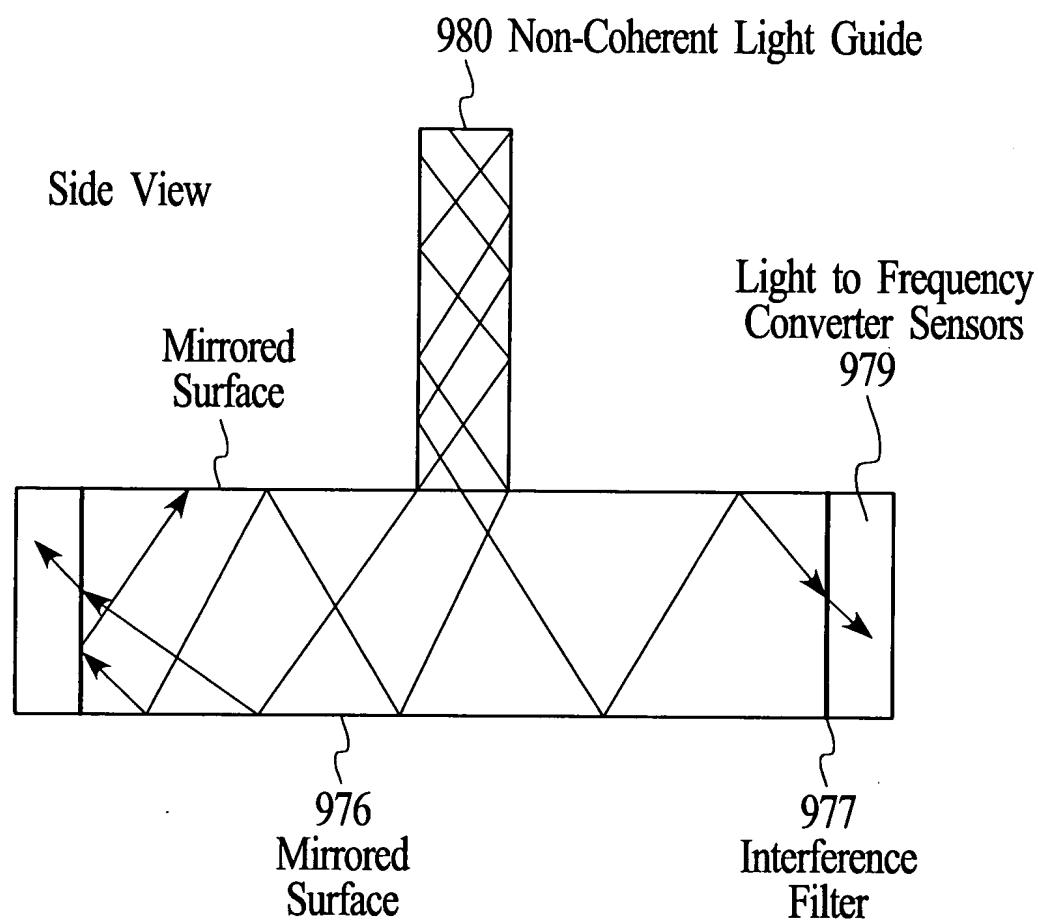


FIG. 85A

Front View

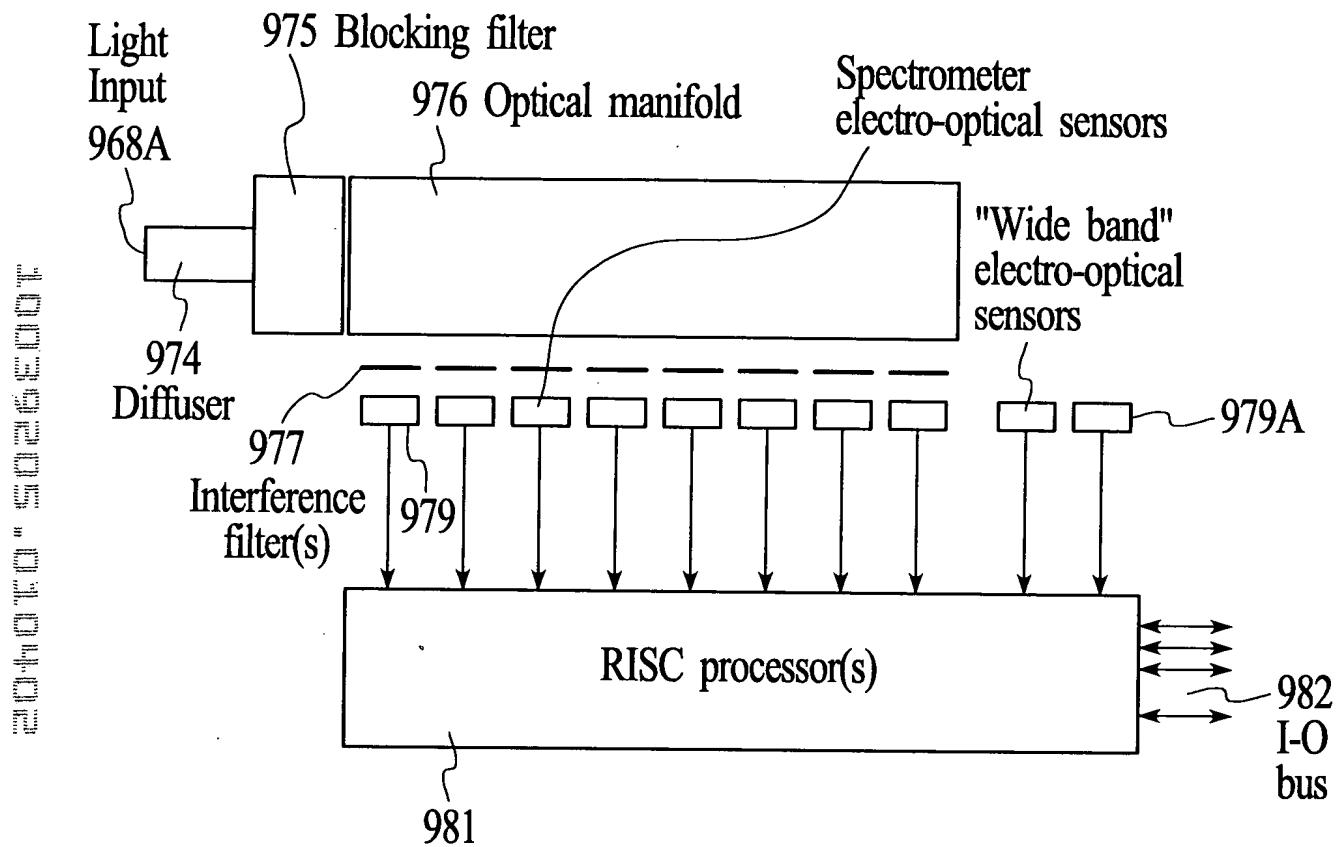


FIG. 85B



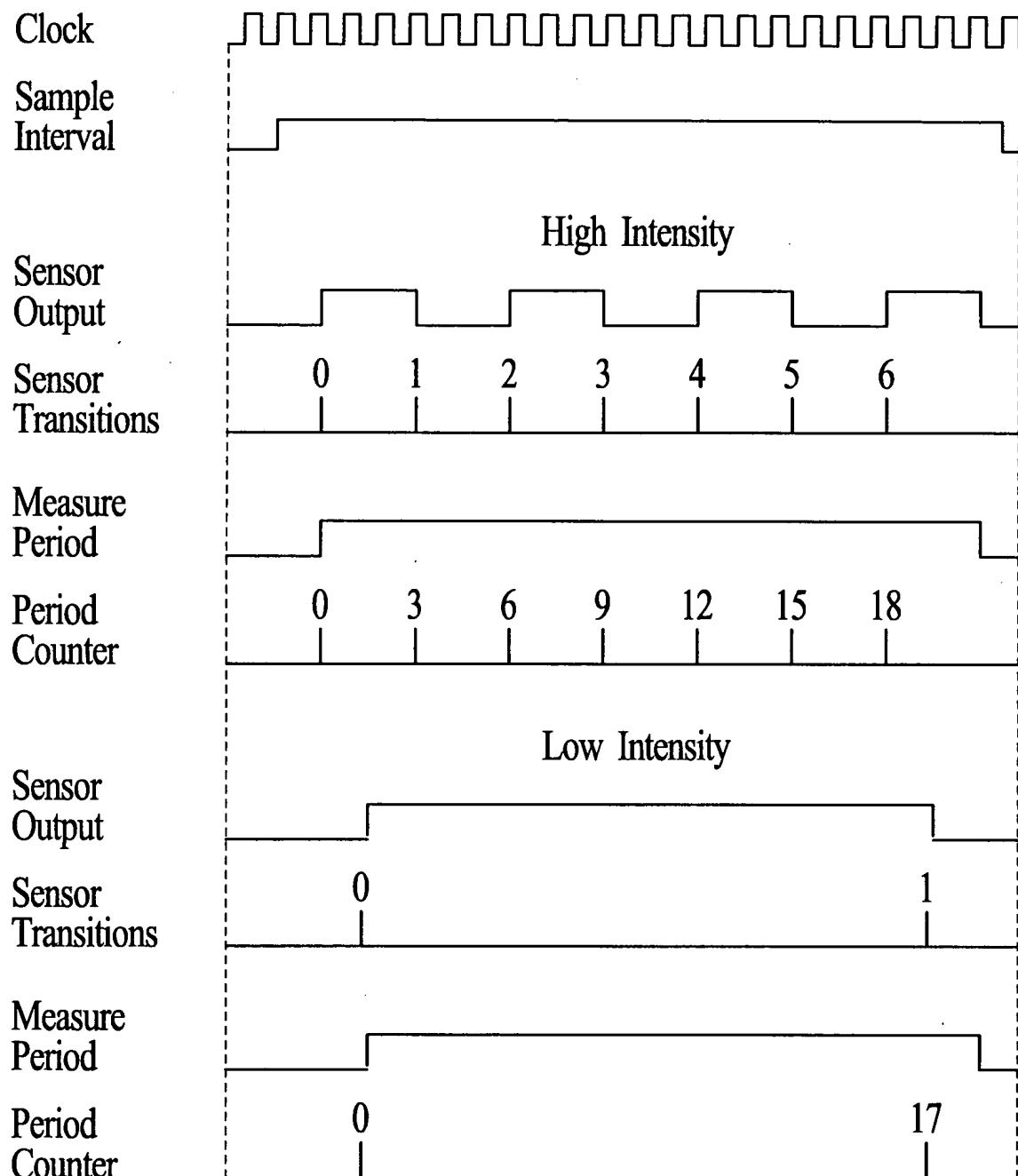
Ray Diagram

FIG. 86



Pocket SpectrometerTM Block Diagram

FIG. 87



Optical Sensors Intensity Measurement Examples

FIG. 88

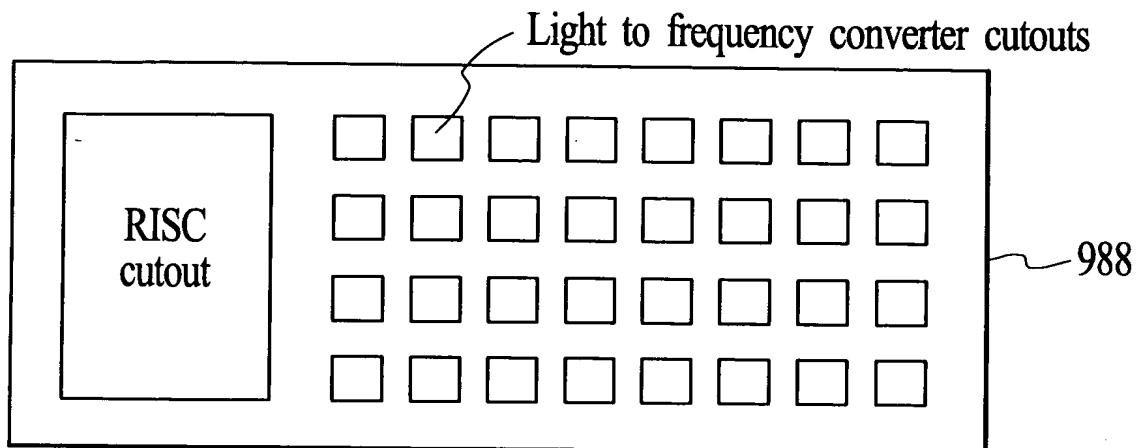


FIG. 89A

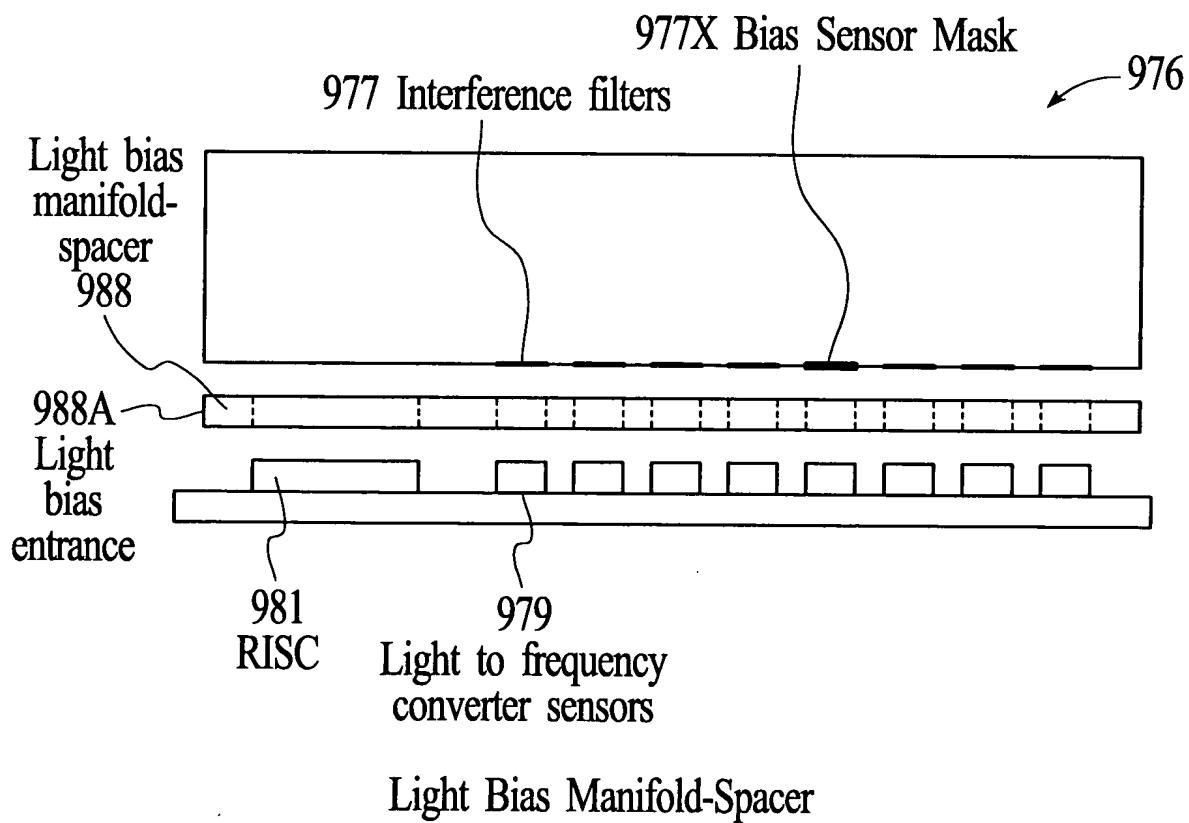
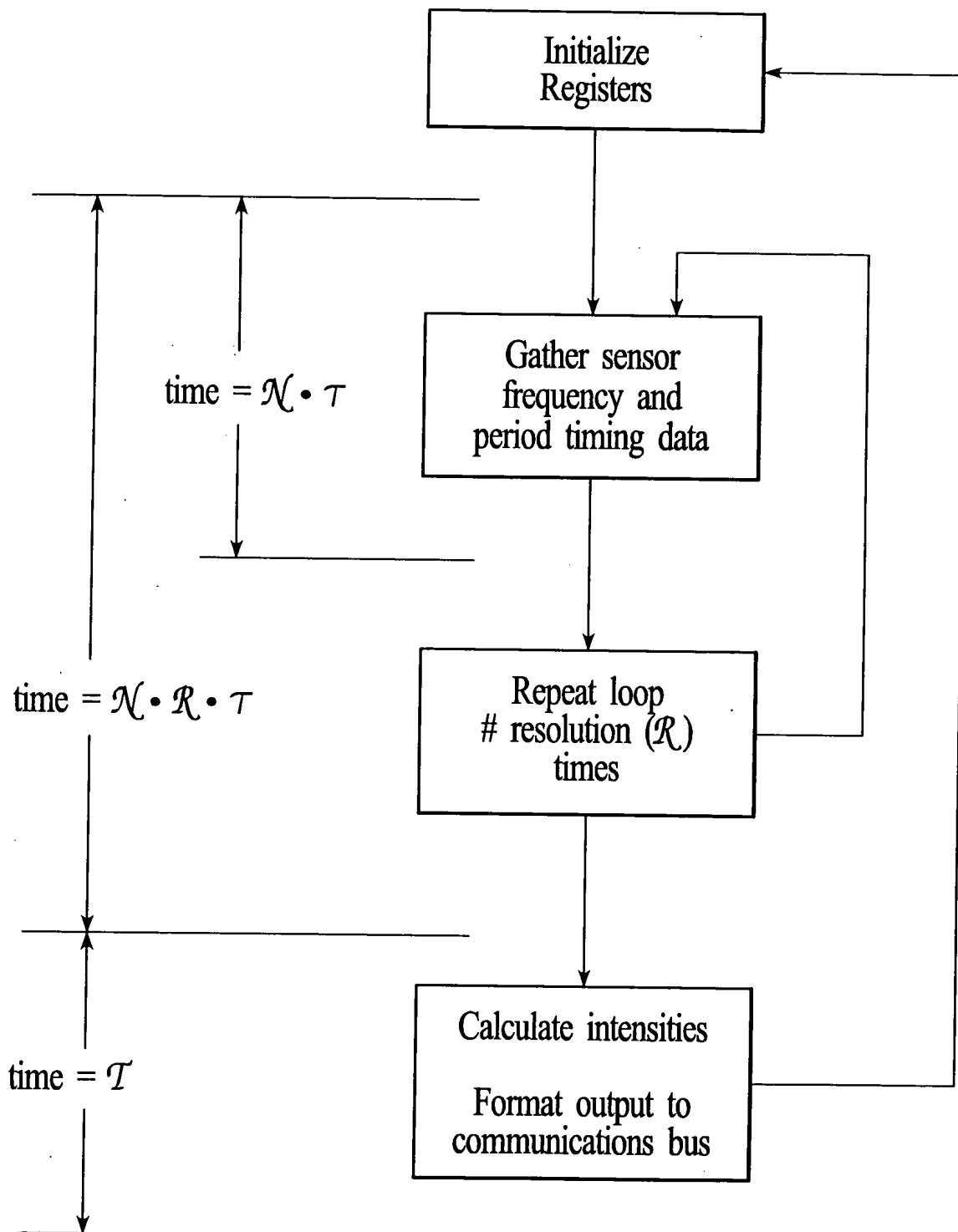


FIG. 89B



RISC Software Timing Flow Chart

FIG. 90A

Register	Description
LOOP_COUNTER	Number of times the sensor is sampled in the timing loop. This register determines the resolution of the measurement and it also determines the sampling rate. The larger the resolution is, the lower the sampling rate.
NEW_INPUT	New sensor(s) input - each sensor input is one bit
OLD_INPUT	Former sensor input
INPUT_XOR	XOR new and old inputs
N_SENSOR	Number of sensors
SENSOR_INDEX	Index to the sensor being tested
TRANSITION_COUNTER[N_SENSOR]	Array - number of transitions that occurred for sensors
PERIOD_COUNTER_FIRST[N_SENSOR]	Array - number of timing loops executed prior to first sensor transitions
PERIOD_COUNTER_LAST[N_SENSOR]	Array - number of loops that occurred prior to final transition
INTENSITY[N_SENSOR]	Array - calculated intensity for sensor

Timing Loop Register Descriptions

FIG. 90B

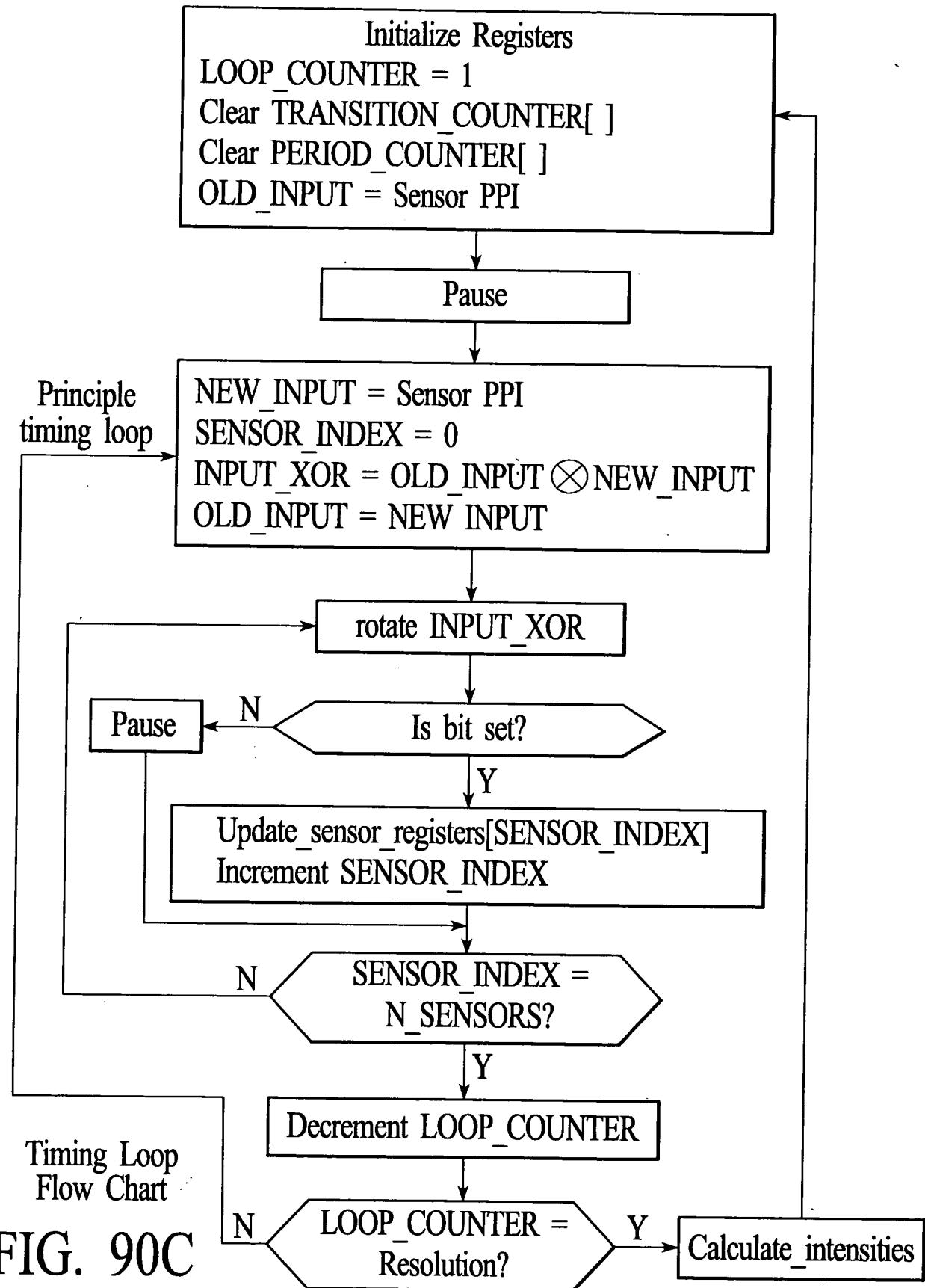
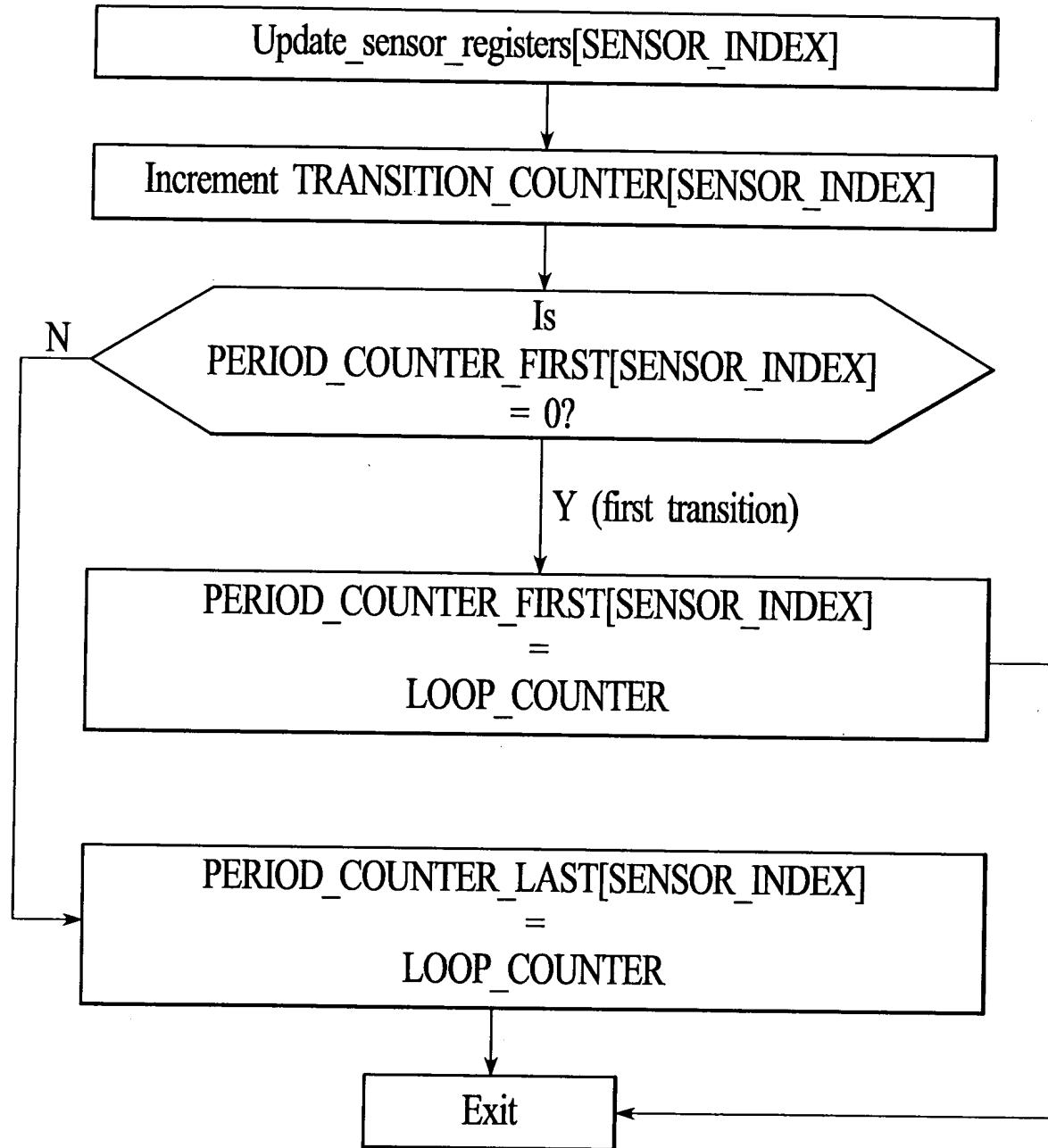
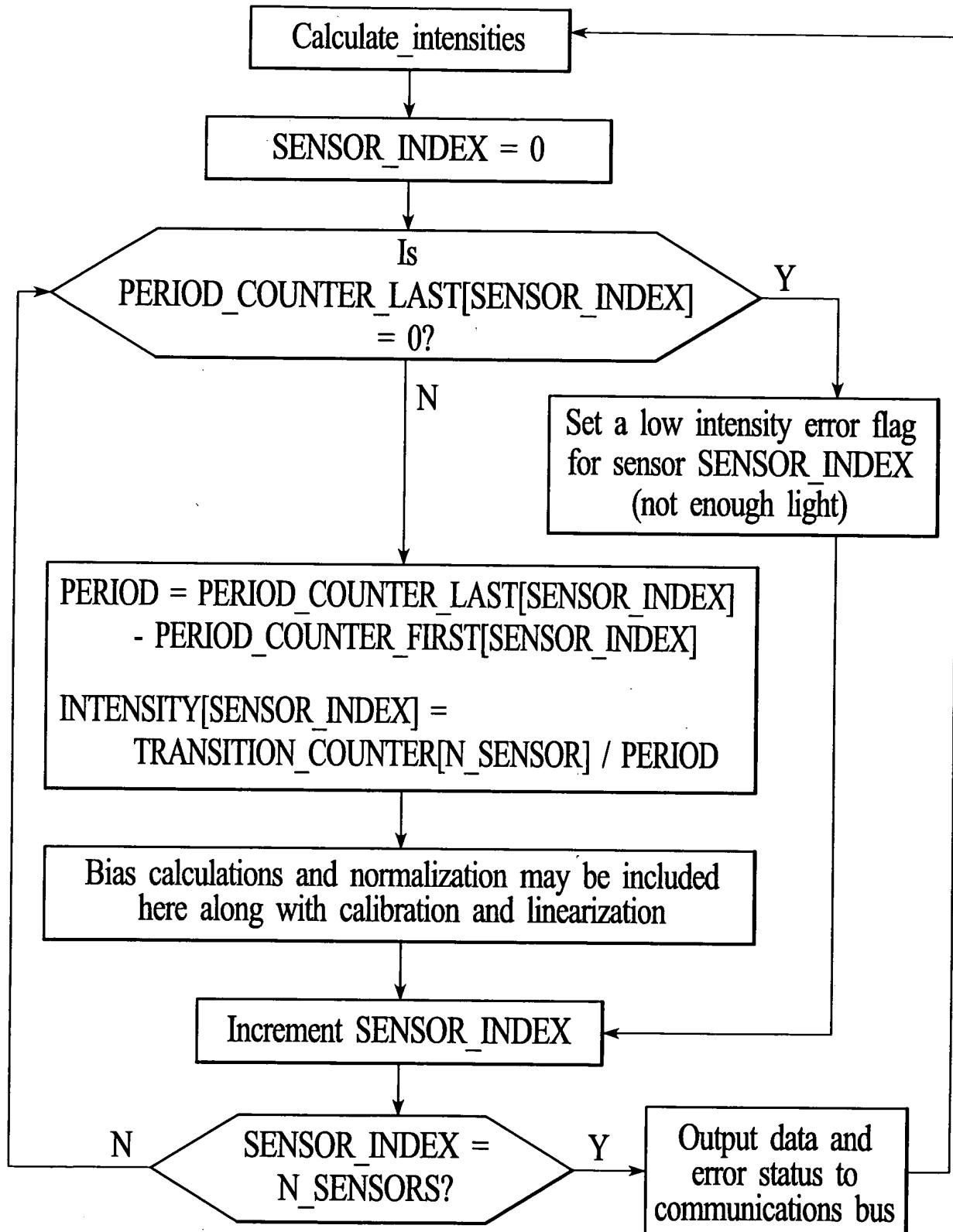


FIG. 90C



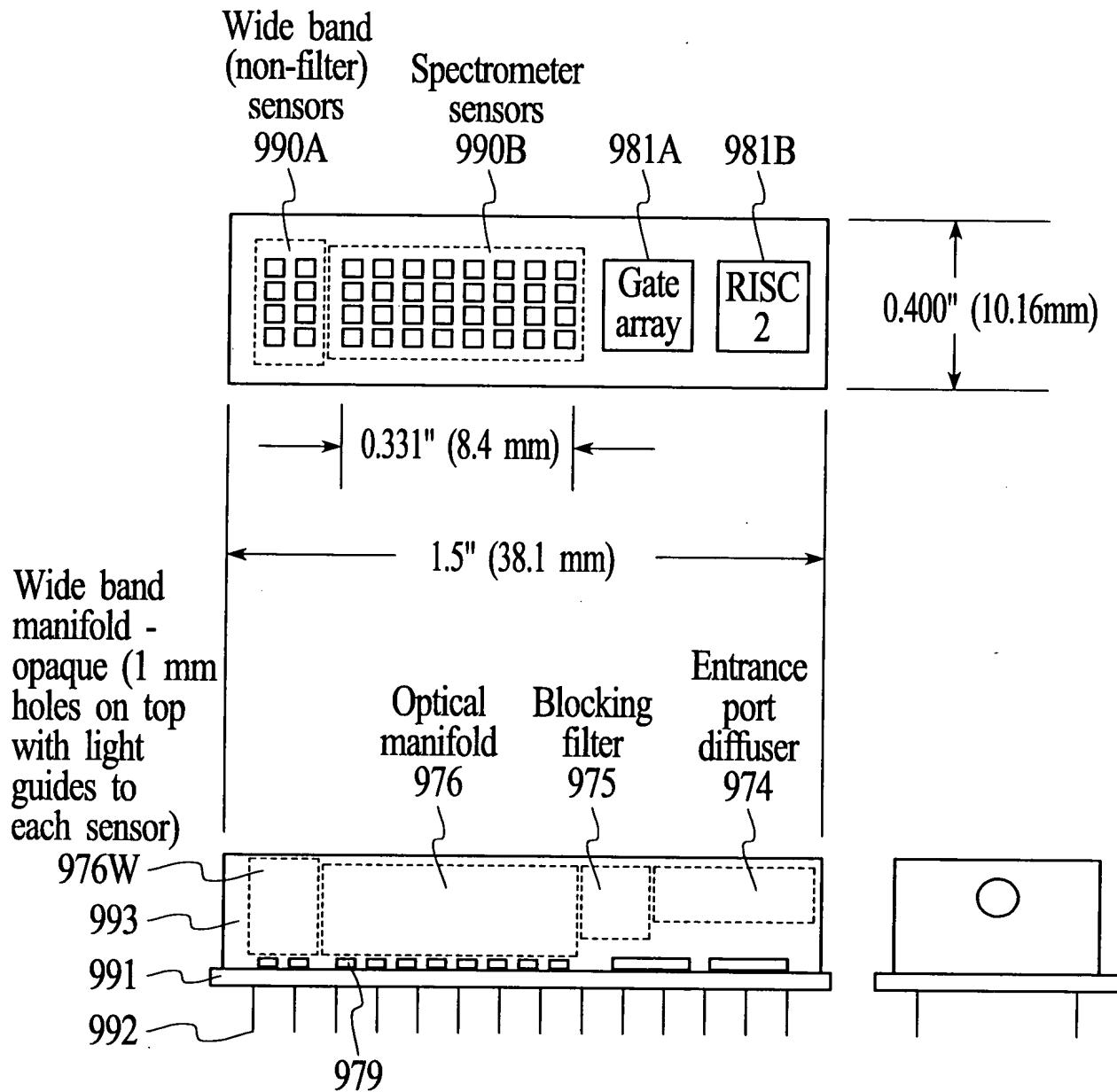
Transition Determination Flow Chart

FIG. 90D



Intensity Calculations Flow Chart

FIG. 90E



Pocket Spectrometer™ Physical, 40 Sensors

FIG. 91

40039205-040202

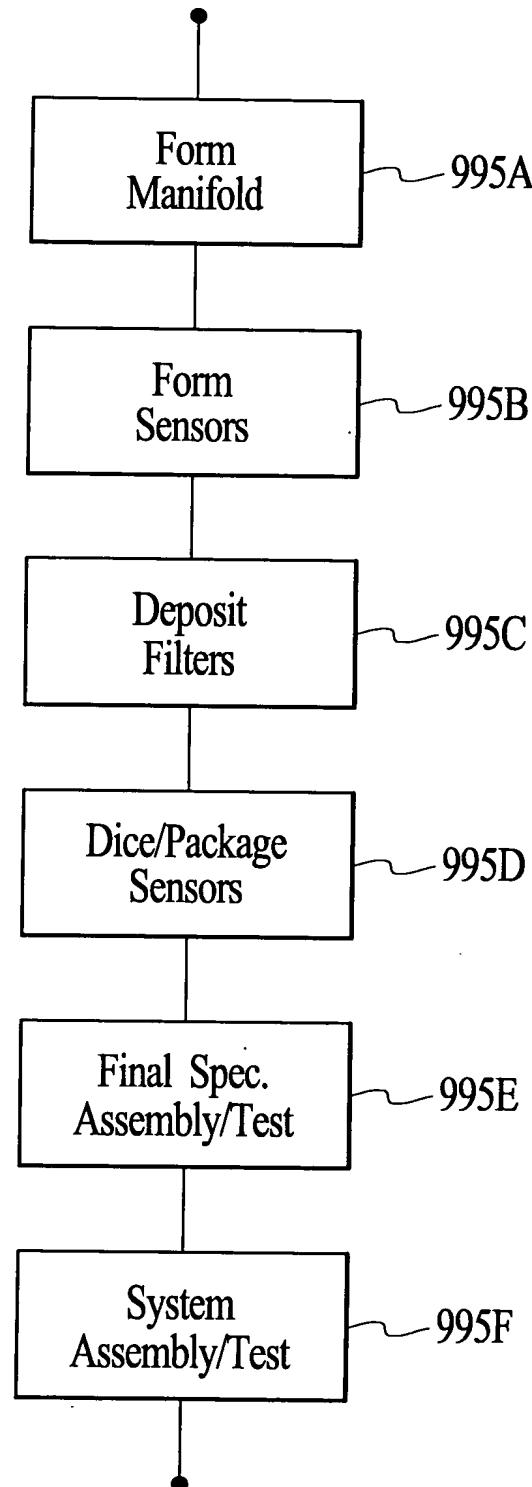


FIG. 92

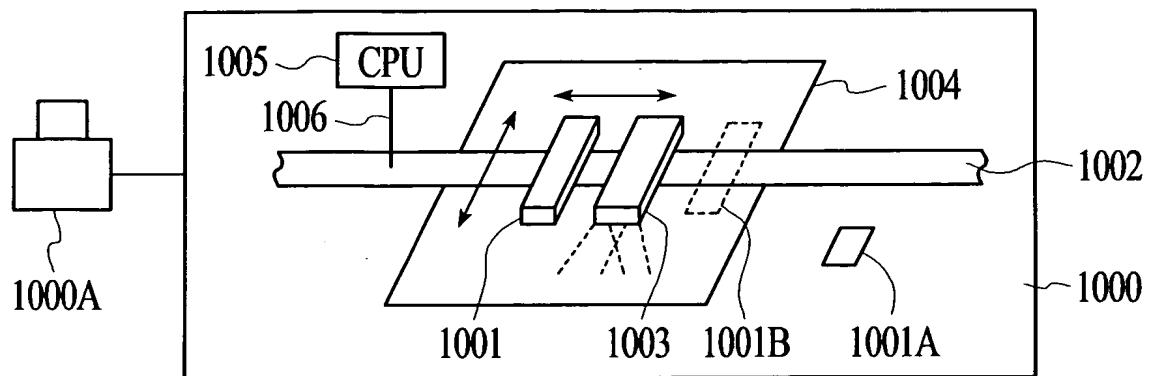
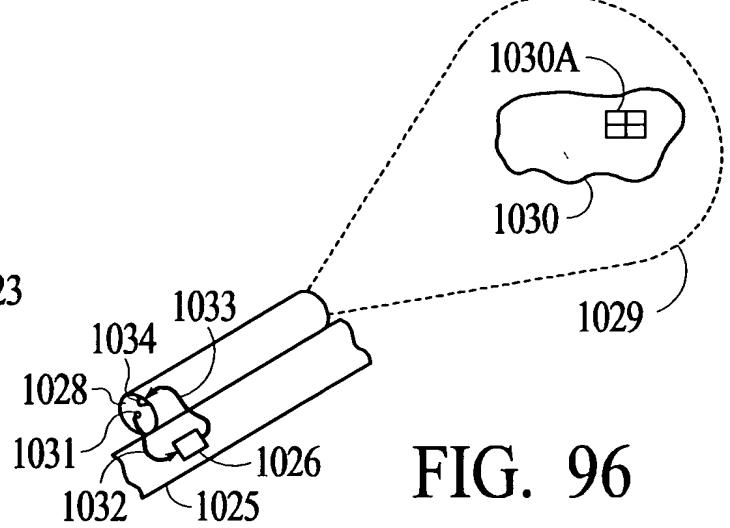
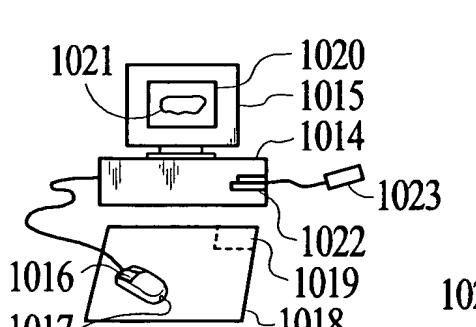
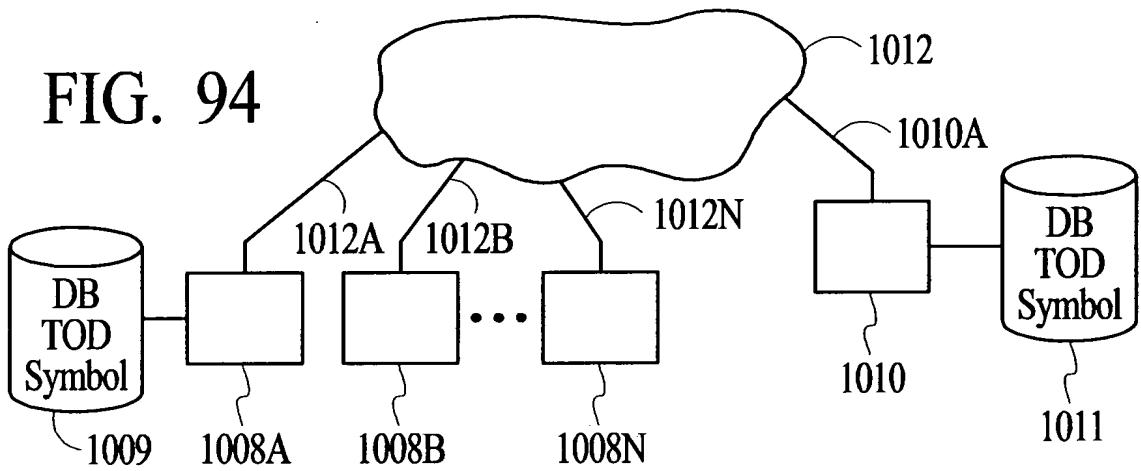


FIG. 94



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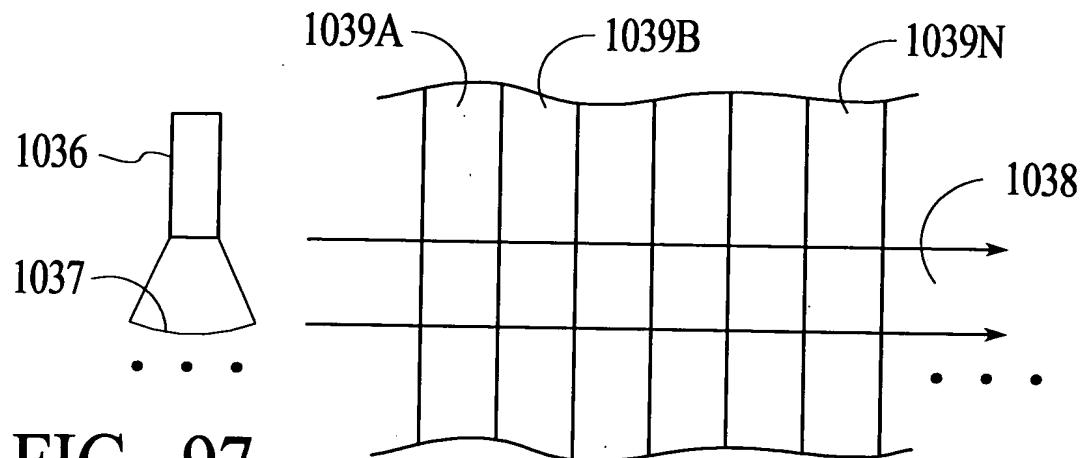


FIG. 97

1003200-00404020

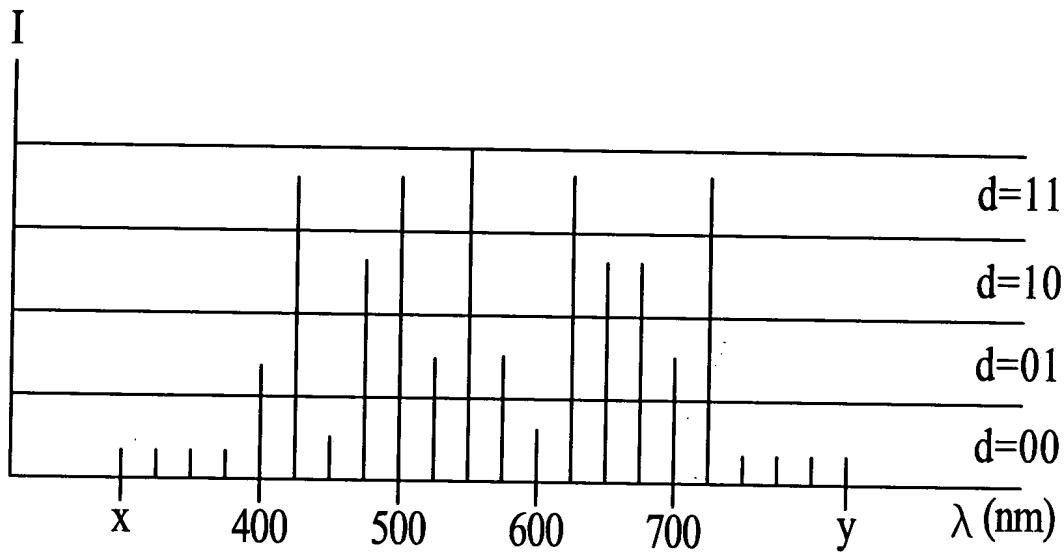


FIG. 98

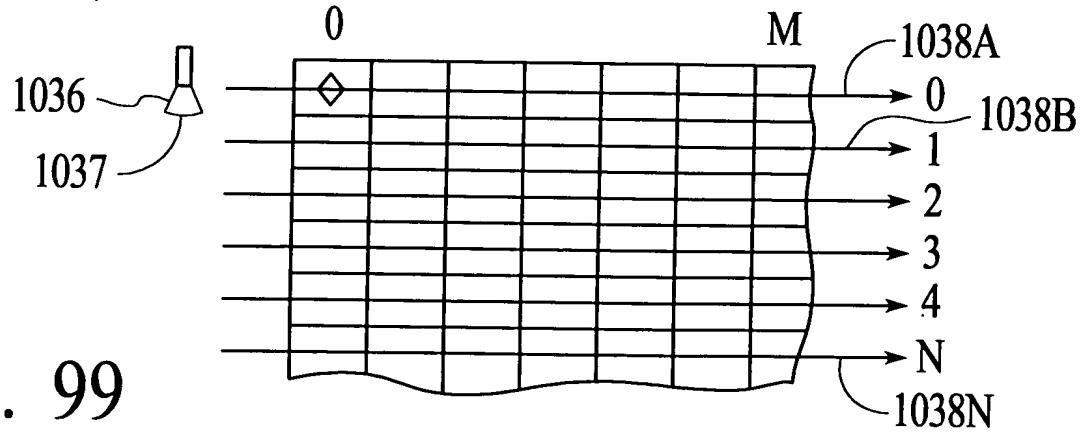


FIG. 99